THE IRON AGE

A Review of the Hardware, Iron, Machinery a[illegible]rades.

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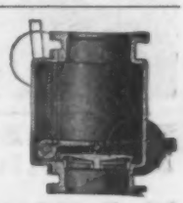

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THE IRON AGE

New York, Thursday, June 15, 1905.

The New Pawling and Harnischfeger Plant.

Pawling & Harnischfeger, Milwaukee, Wis., makers of cranes, hoists, boring mills, steam saw mill feeding engines and electrical machinery, have just moved into their new plant at Thirty-eighth and National avenues. This plant is interesting not only because it is one of the largest of the kind in the world, but particularly because it embodies an ideal system of cranes, hoists and other means for lifting and conveying material. The plant includes a main factory, 260 x 353½ feet, one-story high; a foundry, 110 x 150 feet, with two 66 x 66 foot storage wings; a pattern shop, 50 x 100 feet, and a pattern warehouse, 50 x 116 feet, three stories high; an engine and boiler house, 45 x 105 feet, and a three-story office building, 50 x 75 feet. All of the factory buildings except the pattern warehouse have saw tooth roofs with northern exposure, through which overhead lighting is obtained in addition to that received through the windows in the side walls. The excellence of the lighting may be appreciated from the photographs reproduced herewith, all of which were taken with daylight alone.

Fig. 1.—View in the Girder Shop of the New Pawling & Harnischfeger Plant at Milwaukee, Wis.

A plan of the works showing the disposition of the present buildings and the service of the railroads is given in Fig. 2, and Fig. 3 shows the layout of the main building, containing the machine and erecting shops with their special departments. The latter figure also gives an idea of the location of the most important tools and the crane equipment.

The Girder Shop.

As will be seen from Figs. 2 and 3, the main machine shop building is divided into seven bays. Each of these has its overhead girder, or I-beam electric traveling crane. The extreme western bay, shown in Fig. 1, is known as the girder shop. Spanning this bay and running from one end to the other is a 15-ton electrically operated box girder crane of 60-foot span, having a 5-ton auxiliary hoist. A second crane of same dimensions will soon be placed on the same runway to provide for carrying long structural members without necessitating balancing. On the west side of the building, underneath the gallery, which is used as a templet shop, is a 3-ton 28-foot span trolley bridge, controlled electrically. Between these two is a chain block trolley made from a 12-inch I-beam suspended on trolleys, or shoes, running on the flanges of small I-beams that are suspended from the edge of the gallery. This trolley is moved back and forth by a long shaft and sprocket, a sprocket chain being attached to each of the trolleys on the small I-beams. When the shaft is revolved it moves all the sprockets and trolleys simultaneously, causing the large I-beam, or carrier beam, to travel uniformly. Trolleys, to which tackle is hung, run on the lower flange of the I-beam. This trolley system is used for feeding beams, plates, &c., into the heavy punches and shears below it. The advantage of being able to hold a long structural shape suspended in perfect line and to convey it without losing the alignment is apparent.

On the opposite side of this shop are two small hand actuated traveling wall cranes, from each of which is suspended a Hanna portable pneumatic compression riveter. The cranes and hoists in this department are so arranged that they reach every spot of the floor and material may be picked up by one and transferred to another, often without lowering the article to the ground, and thus conveyed from any part of the department to any other without hand labor. Other machines in this department include two large Cleveland punches, a large Cleveland angle shear, two cold saws, a cutting off machine, a bolt cutter, drill presses, an air compressor and a new Cleveland buildozer. All large tools are direct connected to motors.

The Erecting Shop.

Fig. 4 is a view in the erecting shop. Here two 15-ton electric cranes run on the same track, the span being 60 feet. These cranes are used independently or in conjunction when long members are handled, making it unnecessary to adjust the tackle to balance the load, as is required when only one crane is used.

Two spurs extending from the tracks of the Chicago, Milwaukee & St. Paul and the Chicago and Northwestern railways enter the girder shop and one the erecting shop. These are of sufficient length within the building to accommodate four cars. Heavy material for these shops can be unloaded directly from the cars by the cranes.

A large beam yard lies back of the building and is served by the spurs from the railroads and a narrow gauge railway, which also extends through the building and has a turntable and branch for each bay. This system connects all of the buildings. At present no locomotives are used, the cars on ball bearing trucks being pushed by hand. Spur sidings from the railroads have also been laid, reaching the power house and foundry, to bring fuel for the former and iron and sand for the latter directly to the points where they are to be stored. These narrow and standard gauge tracks, in connection with the very extensive system of cranes and hoists, facilitate the transfer of materials and finished work from one department to another.

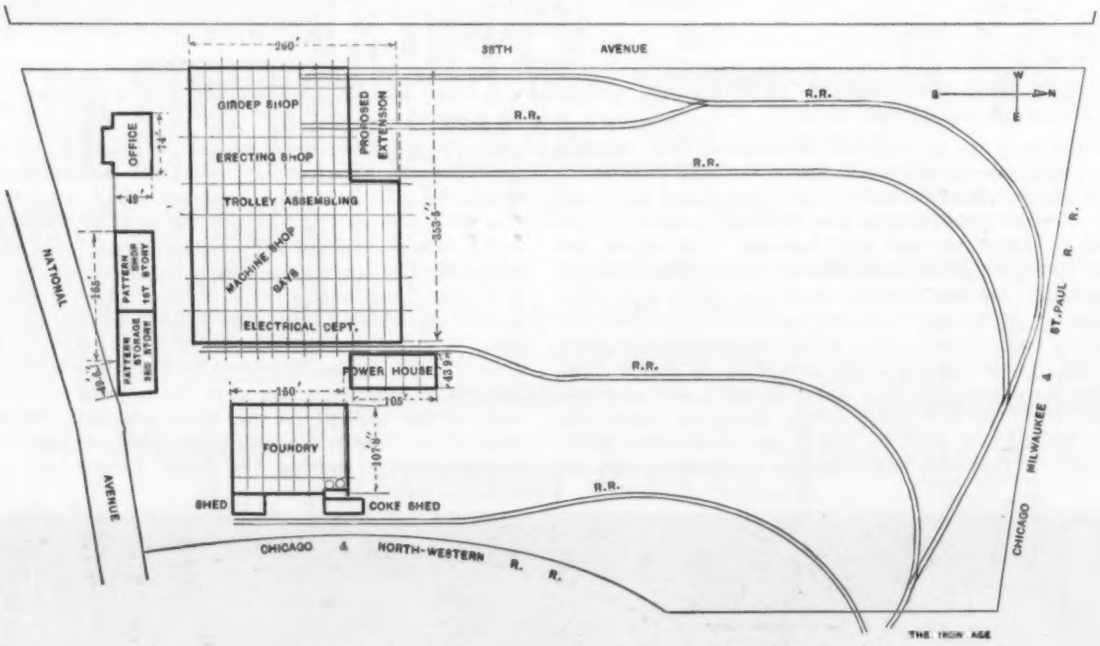


Fig. 2.—Ground Plan of the New Pawling & Harnischfeger Plant.

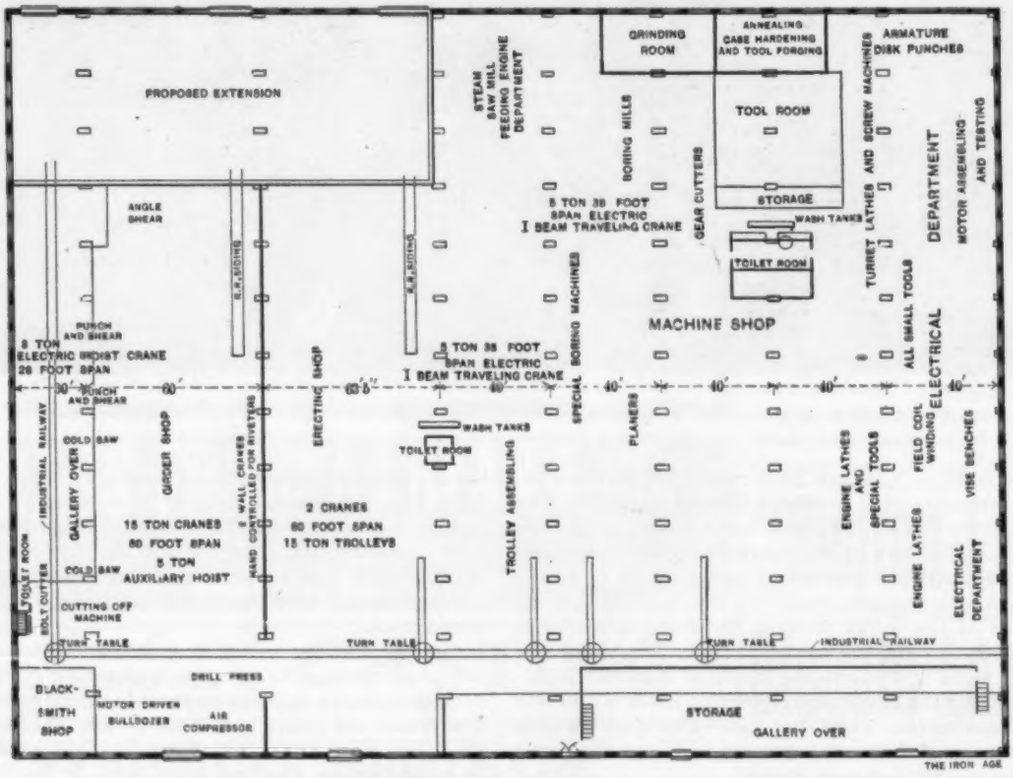


Fig. 3.—Plan of the Machine Shop of the New Pawling & Harnischfeger Plant.

The Trolley Assembling Department.

Fig. 5 is a view taken from the north end of the trolley assembling bay. In the immediate foreground is the

department where the steam feeding engines for saw mills made by this firm are assembled and tested. The remainder of this bay is chiefly used for the work of machining, assembling and erecting trolleys. It contains two Pawling & Harnischfeger horizontal boring machines and two specially designed horizontal drill presses. A 5-ton 38-foot span electric crane of I-beam type runs overhead.

The Machine Shop.

The view given in Fig. 5 may be taken as nearly typical of the next three bays, except in tool equipment, which constitute the machine shop proper. The first of these three bays contains a low row of planers on the east side and on the opposite side a number of special boring mills. This bay is served by a 5-ton 38-foot span electric I-beam crane with trolley. The next bay contains a toolroom at the north end, where tools for use in the plant are made and stored. Beyond the toolroom is a lavatory, and opposite to it a row of gear cutters, some of this bay. A motor to be tested is connected to a testing generator by a flexible coupling to eliminate journal friction due to imperfect alignment, and the motor is then practically under the same conditions as when assembled on the crane. The testing generator is not attached to a fixed base, but swings on the journals of the armature shaft, and has attached to it two lateral arms. One arm is fastened to weighing scales, which measure the effort to rotate, while the other arm acts as a counterbalance. These arms are made a specified length (63⅛ inches) from the center of the generator, to reduce the horse-power formula for a Prony brake to a convenient factor of one one-thousandth, making the equation read $\frac{\text{r. p. m.} \times \text{pounds pull}}{1000} = \text{brake horse-power}$. The tachometer, or speed indicator, is fastened to the end of the motor shaft by a portable connection. The machines are wired up in parallel. The motor is brought to its normal speed, and the field current of the testing generator is

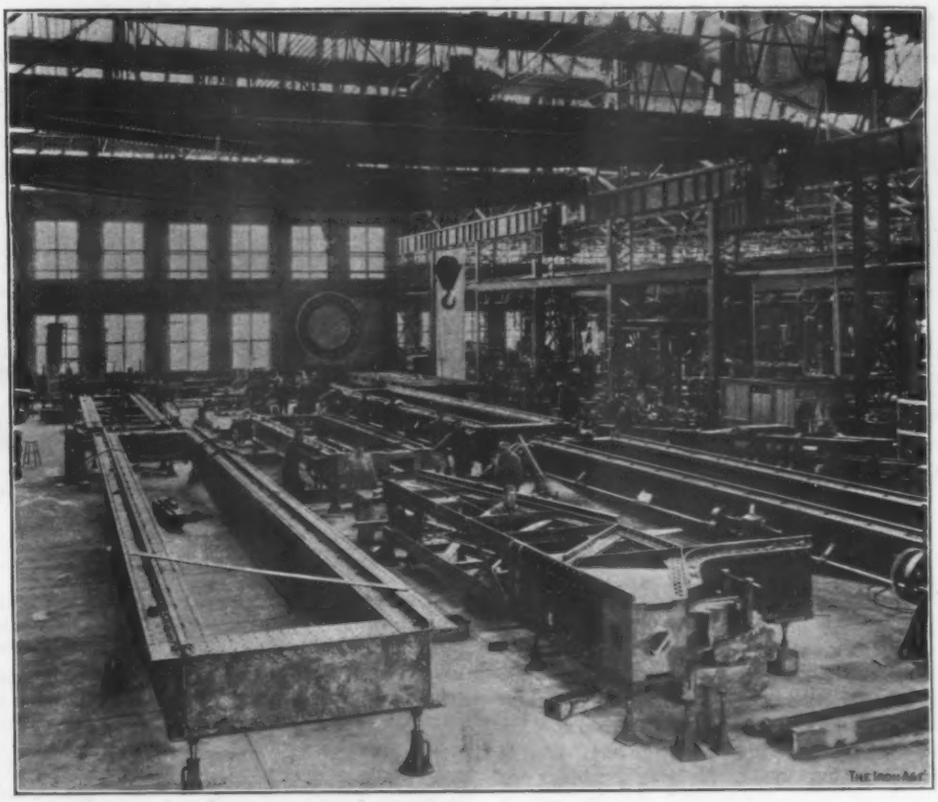


Fig. 4.—A View in the Erecting Shop Adjoining the Girder Shop.

of which were designed and built by the company to meet particular requirements. This bay has the same crane equipment as the two previously mentioned. All of the machinery in the three machine shop bays is belt driven through countershafting from a line shaft for each group. Each line shaft with its group of countershafts is driven by an independent motor, and is suspended from a girder by brackets in such a way as to leave unobstructed passage for the crane and its hoist. The motors are mounted on brackets secured to the iron columns. A typical detail of this system, which is in vogue throughout the plant, is given in Fig. 6.

The toolroom and lavatory extend into the third bay of the machine shop, and opposite to them is a line of turret lathes and lathes of various types. Beyond these is a row of engine lathes extending nearly to the far end of the section. This bay has the same crane equipment as the last three described.

The Electrical Department.

The last bay in the building contains the electrical department. Armature winding is done at the south end, and on the west side are the small tools used in the construction of motors, controllers and other electrical devices. A testing laboratory, where motors and controllers are tried out after completion, is located at the north end regulated until the voltage in the latter is the same as the voltage supplied the motor when the two are switched together. The current for starting the motor and exciting the testing generator is supplied from an outside source. The motor load may be varied by varying the field current in the testing generator. Controllers are tested by wiring them with a motor of large carrying capacity, the armature of which is held by a specially designed brake, this brake being controlled during a test for any desired amperage. The records of motor and crane tests are kept in a very complete card index system, which enables the supplying or duplicating of any part of the mechanical and electrical equipment of a crane.

The Wheel Grinding Department.

Just back of the trolley erecting department is a room containing two grinding machines for truing the treads of crane truck wheels. A wheel to be ground is mounted on the end of a slowly revolving shaft, which is supported in a carriage or bed having screw feed to adjust the work to the grinding wheel. The emery wheel is secured to a shaft which has a lateral motion for moving it back and forth across the face of the wheel to be ground. The hand wheels for regulating the motion of both the emery and the truck wheel are very sensitive.

This special machine was designed by its users. Great care is taken in the work of wheel grinding, each truck wheel being ground to a standard circumferential measure, as the slightest excess of diameter in a truck wheel at one end of the crane over the other would cause the crane to travel out of alignment. Dust in the room is avoided by means of suction pipes, whose mouths rests immediately over the grinding wheels.

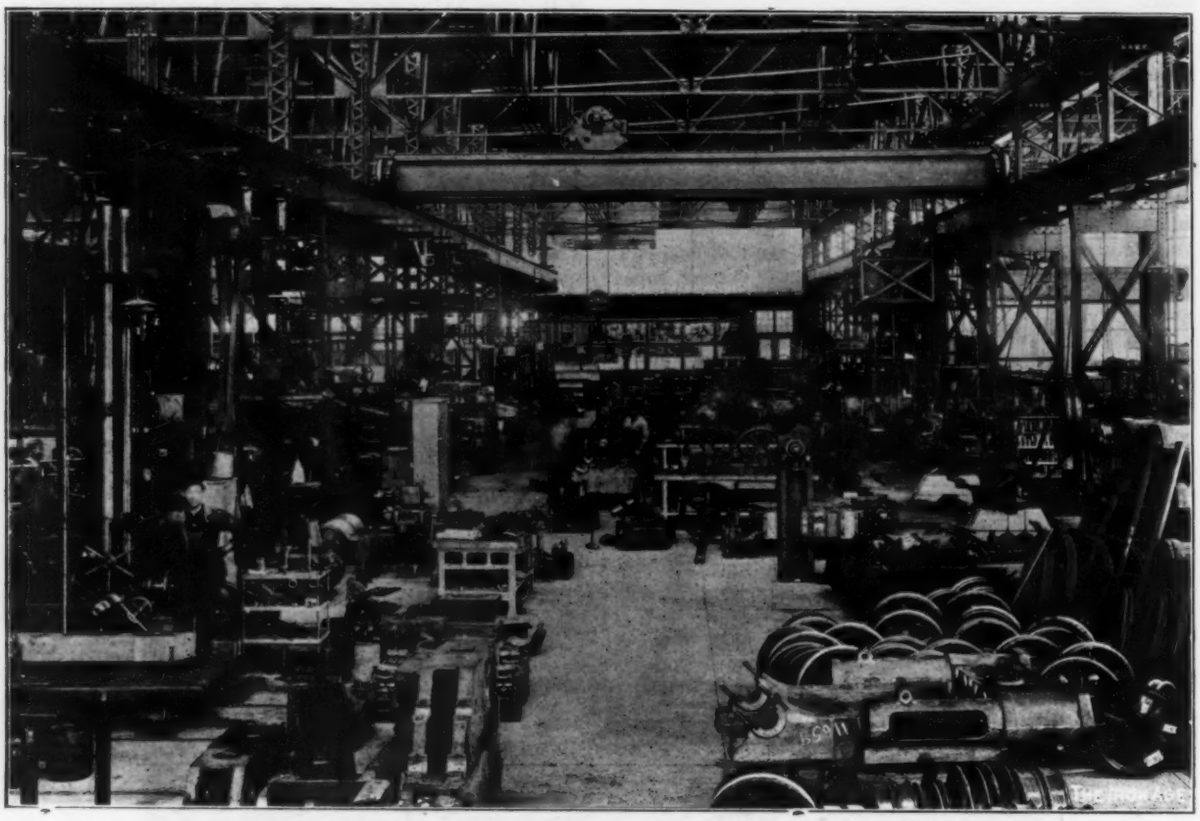


Fig. 5.—View of the Trolley Assembling Department, Taken from the North End.

The Foundry.

Separated from the main factory by the casting storage yard is the foundry, illustrated in Fig. 7. This foundry is equipped with a large 15-ton plate girder crane, 60-foot span, besides a 3-ton electric hoist in the bay. Iron is melted in a 15-ton Whiting cupola. Molding machines are not used, as the work is largely special and duplication of molds is not sufficiently great to warrant the use of molding machines.

The Power House.

The power house equipment consists of the following: Two internally fired boilers, one of which has a Hawley down draft furnace, one boiler having been built by the Power & Mining Machinery Company, Cudahy, Wis.; the other by the S. Freeman & Sons Mfg. Company, Racine, Wis.; a 15 horse-power locomotive boiler built by the latter company; two 200 horse-power Reynolds-Corliss engines furnished by the Allis-Chalmers Company, Milwaukee; one 75 horse-power Ames high speed engine; two 225-kw. 220-volt generators, two 50-kw. light dynamos, one 50-kw. testing dynamo, one Norwalk Iron Works air compressor, one 750-gallon Fairbanks-Morse Company's fire pump for the sprinkler system and fire hydrants and three Prescott pumps for boiler feed and water supply. The water supply for the plant is pumped from an artesian well 500 feet deep, which supplies 100 gallons a minute.

The Heating System.

The whole plant is heated by what is known as the Van Auken system, installed by Van Auken Brothers, Chicago. This system utilizes exhaust steam from the power house during the day and live steam nights and Sundays. The steam from the engines is passed into an 8-inch header, which is secured to the walls of the various buildings about 15 feet above the floor, from which header branches extend to banks of coils overhead in each bay. These heating pipes can be seen high above the crane runway in the various illustrations of the plant. After the steam is passed through the heating coils the condensation is returned to the engine room by a vacuum system operated by a Marsh pump in the engine room. A tunnel connects the power house to the machine shop building and also the foundry, with a branch conduit running from the main factory to the pattern shop. All electric wires for power and light, the pipes for steam heating and water supply, the pipes for compressed air and

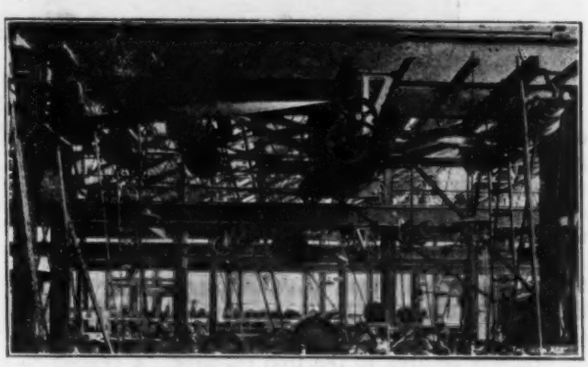


Fig. 6.—A Typical Shafting Detail.

the return pipes of the heating system pass through these tunnels.

Electrical Power.

It has been noted before that all the machinery in the plant is operated by electric motors. Current for these motors is supplied by generators in the power house, as before alluded to. Each shop or bay has its separate switch and circuit breaker, so that when it becomes necessary, because of accident or trouble, to shut down machinery it can be so done that only one bay of the whole plant is affected. An extensive shop telephone system is also in use, telephones being stationed at each foreman's

and subforeman's desk throughout the plant, connecting with the main office building, but not connecting with the city telephone line.

Emergency Hospital.

In the front part of the main building under the balcony is a room known as the Emergency Hospital, which is fitted up with a complete outfit for giving emergency treatment to injured employees.

Fig. 7.—The Foundry of the New Pawling & Harnischfeger Plant.

System and Order.

A visitor to this plant is immediately impressed with the fact that order and system are enforced to the minutest detail. The tools and materials instead of lying about in helter skelter manner are stored in racks, bins

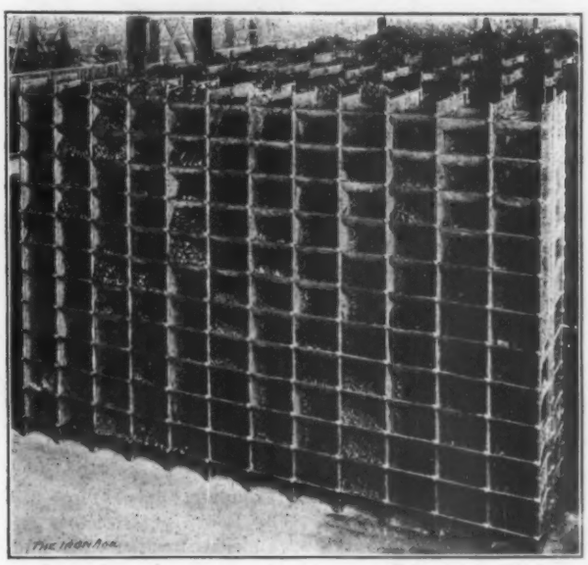


Fig. 8.—A Specimen of the Storage Racks for Bolts and Small Parts.

or other stated places, and very liberal provision is made for such storage. Several forms of steel racks are shown, the one illustrated in Fig. 8 being very largely used. The shelving is of sheet steel, with ¾-inch pipe uprights, ½-inch steel rods and wrought iron base plates and tie strips. Nearly the whole front or south end of the main building is double decked, the balcony as well as most of the space below it serving for the storage of supplies, such as set, cap and machine screws, bolts, washers, electrical supplies, &c. Though thousands of different articles in quantities ranging from a handful to several tons are stored, everything has its distinctive pocket or bin, and a system of numbers and letters is used in connection with the storekeepers' lists, which shows the exact location and quantity of each article in any size.

The Office Building.

The office building, like all the other structures in the plant, is of brick and steel construction, and is handsomely finished throughout. The drafting room contained in this building is exceedingly well lighted, the main light being received from a row of windows on the north side, with supplementary illumination from windows in other walls and through an overhead skylight.

Sewerage and Drainage.

The topography of the land has greatly facilitated the installation of the gravity sewerage system, as the land in the rear half of the 20-acre inclosures slopes rapidly to the north. All the buildings of the plant are connected by lines of pipes of large diameter with suitable traps to a main 8-inch sanitary sewer, which has a grade of from 5 to 6 per cent., connecting with a septic tank, purifying works and filter beds. A 15-inch storm sewer, also leading to the filter beds, is connected with all the buildings of the plant.

A Bit of History.

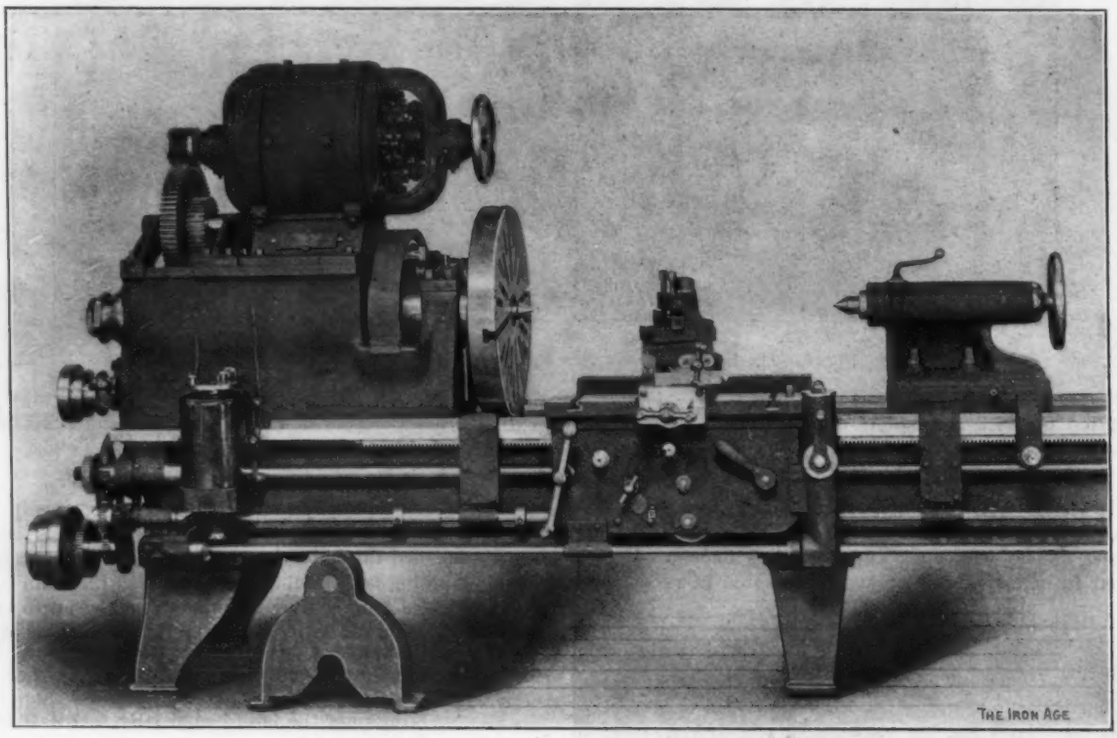
Pawling & Harnischfeger is a partnership consisting of A. Pawling and H. Harnischfeger. The firm was founded 20 years ago in a small way, operating a machine and jobbing repair shop, located at Clinton and Oregon streets, where the firm has been located up to the time of its removal a few weeks ago to the new plant. Its first work consisted largely of jobbing work and machine tools, and later a partnership agreement was entered into with A. J. Shaw, who was at that time a draftsman for the E. P. Allis Company, to build electric traveling cranes. For several years the Shaw cranes were built at the Pawling & Harnischfeger shops until the Shaw Electric Crane Company erected its own works at Muskegon, Mich.

The new Pawling & Harnischfeger plant employs 450 men. Its cost, exclusive of equipment, was in the neighborhood of $300,000. The tract of land, 20 acres in all, is ample for the likely growth of the industry, and the

buildings are so erected and planned that any one of them can be enlarged or even doubled in length without in any way destroying its proper relationship to the others for the most economical transfer of materials and work.

The Reed Motor Driven Engine Lathe.

The accompanying illustration shows the new type of motor driven lathe built by the F. E. Reed Company, Worcester, Mass. The machine shown is a 24-inch, but the same general idea of drive will be applied to all the sizes manufactured by this company. The lathe differs from that which this company has previously built for motor drive in that all rocking gears are dispensed with as well as chain drive. All shafts are fixed, the drive being direct from the motor pinion through a chain of gears to the spindle. The General Electric Company's C. R. type of variable speed reversing motor has been adopted for this lathe, the speed variations of the motor being from 500 to 1500 revolutions per minute. Twenty forward speeds are obtained directly from the motor to the spindle, and ten reversing speeds, that number providing sufficient variations with the same extreme ranges. The lathe is double back geared, so that 20 additional speeds are obtained through each of the back gears, making a total of 60 forward and 30 reversing speeds, the variation being from 7 to 200 revolutions per minute of the spindle. The ratio from motor to spindle on the direct drive is 7.75 to 1, and 23.25 to 1 and 69.75 to 1, respectively, for the two back gear drives. These speeds are on the basis of a cutting speed of 50 feet per minute.



The Reed Motor Driven Engine Lathe.

The lathe is equipped with a convenient device for handling the speeds, which is of importance where large lots of the same size of piece are to be worked. The controller, located at the side of the head directly below the motor, is operated from a reversing box fastened to the right hand side of the apron, the connection being through bevel gears and shaft. The dial of the reversing box on the apron is marked for each speed, forward and reversing, and for the point at which there is no electric connection.

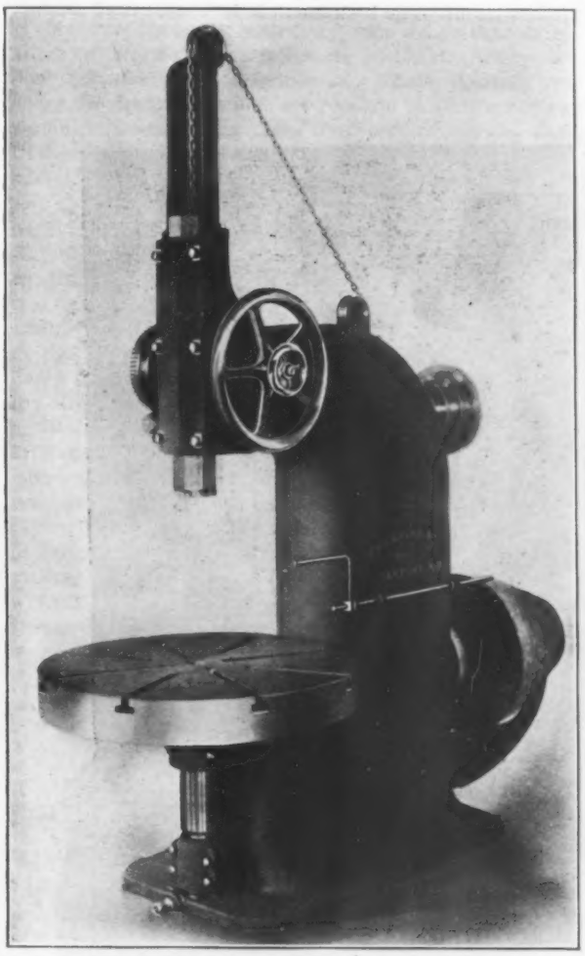
The corporation of the Massachusetts Institute of Technology has voted in favor of the proposed alliance with Harvard University. The faculty and alumni of the institute were in a large majority opposed to this union, but the action of the corporation is presumed to be final. The identity of the institute will be retained, and it will have the income of the various funds which now support the Lawrence Scientific School, as well as the income of the large McKay endowment. The alliance as proposed contemplates the erection of a new home for the institute on the Charles River, at a point about opposite Harvard University in Cambridge.

The Independent Pneumatic Tool Company.—This company has bought the plant and business of the Aurora Automatic Machinery Company, Aurora, Ill., which has recently placed on the market the Thor piston air drills, reversible and nonreversible, and the Thor pneumatic riveting, chipping, calking and beading hammers, piston air motor hoist, air turbine saws and other pneumatic tools and appliances. Temporary general offices of the company have been established in the First National Bank Building, Chicago. The Aurora plant is a large one and is admirably equipped for the production of pneumatic tools of every description. It is described as having a capacity of 1000 tools a month. The officers of the new company are as follows: President, James B. Brady, widely known in railroad supply circles; vice-president, W. O. Jacquette, who has been for years in the railroad supply business; second vice-president, John D. Hurley, one of the founders of the Standard Pneumatic Tool Company, which was absorbed by the Chicago Pneumatic Tool Company; secretary, A. B. Holmes, who was assistant manager of the Standard Pneumatic Tool Company; treasurer, C. E. Erikson, who was treasurer of the Aurora Company; mechanical superintendent, A. Levedahl. The Board of Directors includes men of prominence in Chicago business life and consists of the following: James B. Brady, W. O. Jacquette, John P. Hopkins, John D. Hurley, Simon Florsheim, John M. Glenn, J. J. McCarthy, C. E. Erikson and Louis D. Dailey. The company is now manufacturing a full line of pneumatic tools and is beginning actively to push their sale.

The National Transit Company is buying two sets of 1000 horse-power gas engines coupled with generators for power purposes for use in the West Virginia gas belt.

A New Bickford Vertical Chucking Machine.

The 36-inch vertical chucking machine illustrated herewith was designed as a moderate priced tool for certain classes of work which are usually done on an engine lathe. The machine has some of the features of the vertical boring and turning mills built by its makers, H. Bickford & Co., Lockport, N. H., including the octagon spindle. The spindle feed is operated by a pinion on the feed shaft extending through the spindle box, which engages a rack cut in the spindle. The friction worm drive is on the left side of the head and is unusually large and heavy. This worm runs in oil and is driven by a powerfully geared feed shaft connected with the main driving



The Bickford 36-Inch Vertical Chucking Machine.

shaft through a four-step cone pulley by a 1½-inch belt, giving four changes of feed. The large hand wheel on the right side of the head in the illustration provides the quick return, and the friction feed is engaged through the small wheel located at the same point.

The table is driven by heavy planed bevel gears, and turns on a large spindle fitted with boxes that are accessible and easily adjusted. The weight of the table and work is carried by a hardened and ground steel step submerged in oil and adjustable by a wedge and heavy screw, which may be seen in the front bottom flange of the frame. The driving shaft is supported by three long bearings, the outer one of which is supported from the main frame of the machine by a heavy arm. The same form of octagon tool spindle is used as is supplied with the Bickford boring and turning mill, because it is believed that this form will wear longer and may be more easily adjusted than any other. It is carefully scraped to a bearing on four alternate sides and is adjustable for wear. The spindle is counterbalanced by a weight inside of the frame of the machine. The lower end of the tool spindle is bored to a No. 6 Morse taper to receive tools. The end of the spindle is vertically over a 1 15-16-inch reamed hole in the table to allow the use of a strong and rigid boring bar. The total vertical movement of the tool spindle is 29 inches and it will withdraw into its box 6½ inches to facilitate removing work without detaching the boring tool.

The table ordinarily furnished is 37 inches in diameter and is provided with T-slots. Detachable chuck jaws can be furnished or a complete special chuck table to order. The driving cone pulleys have five steps, each 3½ inches wide, and at a countershaft speed of 82 revolutions per minute give table speeds ranging from 15 to 50 revolutions per minute, suitable for boring holes from 1½ to 5 inches in diameter at a cutting speed of 20 feet a minute.

The over-all hight of the machine to the top of the counterbalance chain is 8 feet 5¼ inches, and the floor space occupied 7 feet 6 inches x 3 feet 1½ inches. Its actual swing is 37½ inches and it will take work 23 inches high. The machine is primarily intended for boring car wheels, gears and a variety of work of this class where quick and accurate results are required at the least outlay for equipment.

The Philadelphia Foundrymen's Association.

The regular one hundred and forty-eighth meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club, in that city, June 7. This meeting was somewhat of a departure from those usually held by the association, inasmuch as the address made before the association, entitled "Providing Physical Comfort Where Labor is Performed," was delivered by Miss Gertrude Beeks, secretary of the Welfare Department of the National Civic Federation, New York. This is the first time that a lady has addressed the association, and was also the first meeting at which ladies were in attendance. Miss Beek's address, which was illustrated with a large number of lantern slides, brought out the many advantages of proper ventilation, drinking water, lunch rooms, shower baths, locker rooms, light, hospital and gymnasium work in foundries and machine shops, as well as other industrial plants, and was greatly appreciated by the members, their friends and ladies present.

The treasurer reported a substantial balance in the treasury with all debts paid, and adjournment was taken until September 6, covering the usual summer recess.

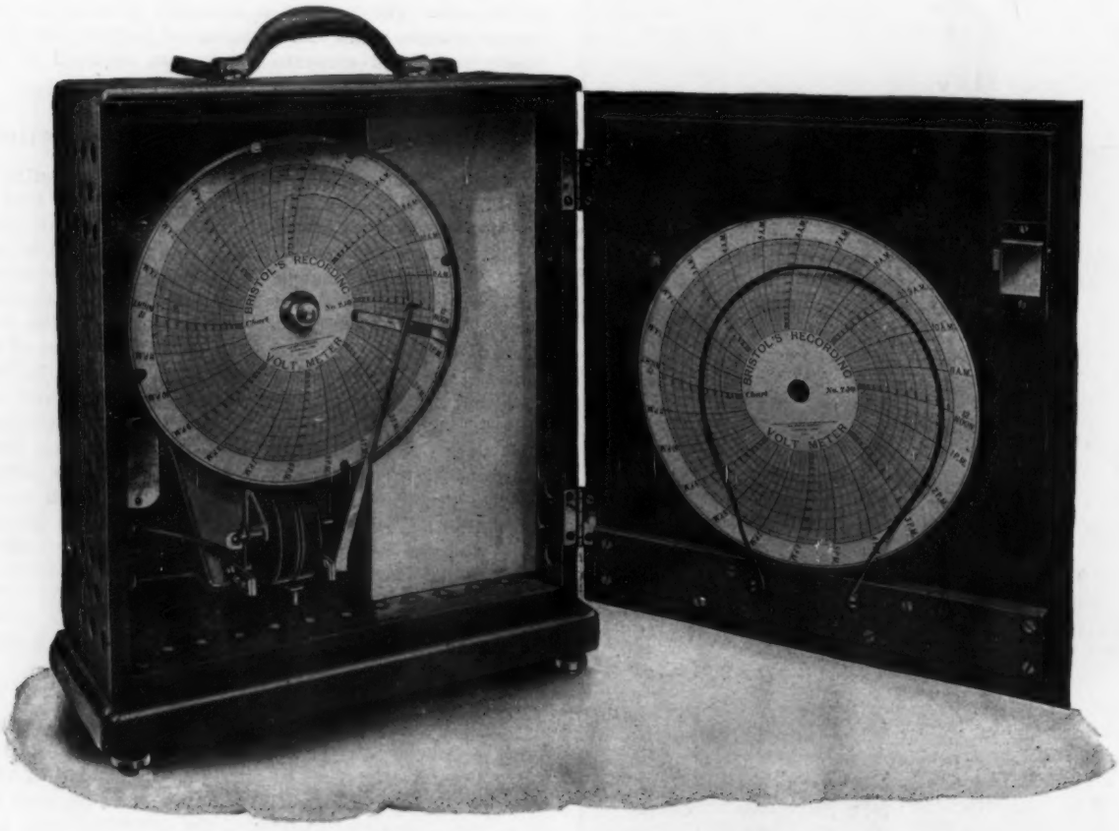
The Milwaukee Industrial Exposition Building, occupying a full square near the heart of the city, burned to the ground June 4. The building was erected in 1880 at a cost of $300,000, and for many years was used for an annual industrial exhibit of the manufacturing and commercial industries of Milwaukee. It had also been used for many large public assemblages and conventions, which had trade exhibits as an accessory feature. One of the last conventions of this character was that of the Carriage Builders' National Association in October, 1904. The burning of the old structure has given added impetus to a movement to erect a mammoth auditorium building suitable for concerts, conventions and trade exhibits. The Merchants' and Manufacturers' Association of Milwaukee fathered a bill before the Legislature, which since the fire has been pushed to an early passage, and which will make possible the organization of a corporation which in connection with the municipality of Milwaukee will be authorized to erect a building suitable for such purposes. The plans at present talked of contemplate the erection of a building to cost $400,000.

With 16 vessels under order at lake shipyards for delivery in 1906 practically all available berths are now taken a year ahead, a condition never existing before. With repairs, the lengthening of vessels and further orders pending for new vessels, full occupation for the lake yards seems now assured for 18 months. The 16 vessels, as above, added to those finished, or to be finished, this year, make a total of 40 new boats, with a total ore carrying capacity on one trip of 360,500 tons. In a season, estimating 20 trips, they could carry 7,210,000 tons of ore. Such an unprecedented addition to the lake fleet suggests large expectations as to the increase in iron ore shipments in the next few years.

The New Bristol Recording Voltmeter.

The importance of maintaining uniform voltage in the generation and distribution of electricity for light and power has long been appreciated by both the producer and the consumer. A variation of comparatively a small percentage in the voltage of an incandescent lighting circuit from the standard for which the lamps are designed causes great loss in the life of the lamps and results in wide fluctuations in the efficiency and candle-power. In the application of electric power, as, for instance, on an electric railway, it is of great importance that the voltage be maintained regardless of the variations in the load.

The recording voltmeter has proved itself to be of great value and is an indispensable part of a modern electric plant, since it accurately, automatically and continuously furnishes a written record of the slightest variation of the voltage. The recording voltmeters manufactured by the Bristol Company, Waterbury, Conn., have been extensively adopted, but up to the present it has been necessary to furnish the instruments with entirely different current coils, according to their use as employed upon alternating or direct current circuits.



The New Bristol Recording Voltmeter for Both Direct and Alternating Current.

In many electric plants both alternating and direct current are generated, and if the same voltmeter can be used equally well for recording either kind of current it is quite evident that a valuable advance has been made. This has been accomplished, the accompanying illustration showing a special portable form of the instrument. The case is provided with a handle and leveling screws for convenient transportation and adjustment. The door is open, showing the construction and manner of operation.

The novel features and improvements in this new voltmeter are as follows: 1, It is equally applicable to both alternating or direct circuit; 2, it requires only one-third as much current to operate as that necessary for the older design for alternating currents; 3, it is more sensitive to very slight variations of voltage; 4, the chart graduations are nearly uniform on both sides of the working range; 5, the portable form of the instrument in its carrying case is only half the size and weight that were formerly required.

The solenoids shown in the illustration are connected, so that when current is passing through them in series the movable solenoid will be repelled from, instead of being attracted toward, the stationary one. The movable solenoid is mounted on a frictionless knife edge multiplying device, which transmits its motion to the pen arm, carried by the knife edge blade. This simple multiplying device permits the solenoids to be located very near each other, and consequently the magnetic field of force is uniform throughout the motion of the solenoid, resulting in the desirable scale divisions of the chart.

By making the constructions of the solenoids so that there is repulsion instead of attraction, the mutual inductance between them is neutralized, thus making the same instrument suitable for recording either alternating or direct current. The instrument is independent of the rate of alterations and is compensated for changes of atmospheric temperature.

A Large Expanded Metal Order.—What is stated to be the largest single order ever placed for expanded metal was recently awarded by the Mexican Government to the Central Expanded Metal Company (Chess Brothers), Pittsburgh, Pa., for about 2,000,000 square feet of 3-inch mesh, 10-gauge, double width strands, weighing 11 pounds per square yard. This aggregates over 1200 tons of expanded metal. The contract was made by V. Cascino, City of Mexico, the resident representative of the Central Expanded Metal Company, and calls for the delivery of the material in 14 months. It is to be used in constructing an aqueduct for supplying the City of Mexico with water. This is known as the Xochimilco aqueduct, from the fact that the water supply is at Xochimilco. The conduit is to be oval in form, 6 feet wide and 5 feet high, and will be 15 miles long. There is sufficient fall to make pumping unnecessary. The Mexican Government is building a railroad along the right of way for the purpose of transporting materials and men, and has also erected shops at Condesa for the purposes of this construction. The engineer in charge of this project is Manuel Marroquin y Rivera. The aqueduct will cost $9,000,000.

Puddled Iron Versus Steel.

BY F. N. SPELLER, NATIONAL TUBE COMPANY, PITTSBURGH.

In view of Mr. Roe's comments in *The Iron Age* for June 1 on my criticism of his paper on "The Manufacture of Wrought Pipe" some additional data on the points on which he lays particular stress may be of interest, although his argument loses considerable weight by his frank statement of partisanship in discussing the relative merits of iron and steel. From his point of view possibly my conclusions appear biased, but before having had an opportunity to compare iron and steel pipe in the mills and in service and to investigate cases of corrosion closely I had a vague impression favoring the relative durability of iron.

Mr. Roe discounts laboratory tests on account of absence of strains and contiguous material. These are doubtful and variable influences. That repeated tests under the conditions which are common to all cases of corrosion, but eliminating these uncertain conditions, show iron of different grades to vary widely in its rate of corrosion, some showing less and some greater loss than the soft steel we are discussing, is surely significant. In my paper in reply to Mr. Roe space did not permit the description in detail of more than one case under "working conditions." This was, however, a good illustration of the common error of presuming a defective pipe to be steel, without investigation. It was deemed better to take up one case fully than to fill in with general deductions based on appearances or hearsay, which has been shown too often to be deceptive.

Returning to Mr. Roe's inquiry as to how many months or days steel would have lasted under the conditions which prevailed in the pressure line referred to, in this case at least his inference that steel pipe would have shown up much worse than wrought iron, which gave way in one year, is further evidence of the need of caution in making such deductions. Information received after writing the account of May 25 reports the discovery of steel sections of the same pressure pipe in this mill which

Fig. 1.—Cross Section of Wrought Iron, Etched, Enlarged About 60 Diameters.—The Black Sections of Strings and Layers of Cinder Are Shown in Their Relation to the Boundaries of Metallic Grains.

under the same conditions were similarly affected. A vertical length was uncorroded, while the adjoining horizontal piece had gone in a manner very similar to the wrought iron section previously described. This steel pipe had been in use 14 months; it analyzed:

	Per cent.
Carbon	0.07
Manganese	0.27
Phosphorus	0.107
Sulphur	0.060
Silicon	0.008

We have yard locomotives in which iron and steel tubes were purposely placed side by side and which have been in service five or six years, showing little difference in pitting. An inspection of tubes from one of these engines, after three years' service with Monongahela River water, showed the iron tubes to be, if anything, more pitted than the steel.

In speaking of the grains or crystals being "surrounded by an envelope of cinder," Mr. Roe puts this objectionable foreign matter into a position which greatly exaggerates any effect it may have in temporarily interfering with corrosion. In so doing I maintain he is unfair to iron, for it is evident that with cinder as the binding material my statement to the effect that the transverse strength would be unduly reduced does not need modification. An average of tests on charcoal iron carrying 1 per cent. cinder shows:

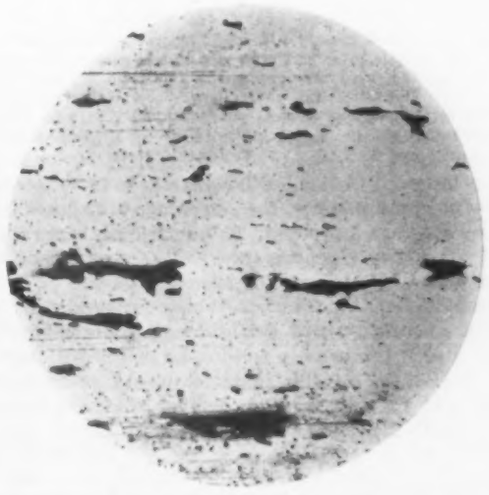


Fig. 2.—Cross Section of Wrought Iron, Unetched, Showing Cinder Only.

	Longitudinal. Pounds.	Transverse. Pounds.
Tensile strength	47,400	45,470
Elastic limit	29,080	28,680

On the lower grades of iron the transverse strength is, of course, more or less reduced.

The photo-micrographs given herewith show cross sections of wrought iron enlarged about 60 diameters. The black sections of strings and layers of cinder are shown in their relation to the boundaries of metallic grains, which were brought out by etching in Fig. 1, while in Fig. 2 the cinder only is shown. No attempt has been made to deny that the poorer grades of iron have, generally speaking, apparently an initial power of resisting corrosion somewhat superior to steel. But painstaking observation shows this to have been greatly exaggerated, to the prejudice of weldable steel, and, when we consider the effect of slight changes in environment, this difference is important, principally as a talking point for those interested exclusively in the manufacture of wrought iron. Our experience of years in working with both materials recognizes the merits of each for certain purposes, but as the superior qualities of modern soft weldable steel have been developed wrought iron has been gradually displaced in most lines with advantage.

As to the relative strength of the weld, experience in the field bears out the tests described before. Perhaps the cases of split pipe referred to by Mr. Roe are similar to many examined by the writer where the "steel" proved to be wrought iron. It is now generally understood that splitting is usually due to defective or improperly shaped dies.*

Cold bending is probably the most severe test of a butt weld. The following letters from makers of electric conduit pipe represent the record of practically all the pipe bent in this country for electric conduits:

Dear Sir.—Answering your inquiry as to our experience in bending soft steel pipe, would say that we make at our factory anywhere from 15,000 to 20,000 bends per month, the sizes of pipe ranging from ½ inch to 3 inches, inclusive. In the above quantity we rarely find as many as 25 bends that will open in

* See discussion on principles of die construction, page 744, *The Iron Age*, March 2, 1905.

the seam—in fact, there have been some months when we did not have over 6. These bends are made cold, and are bent to as short a radius as 4½ inches in the smaller sizes.—SAFETY-ARMORITE CONDUIT COMPANY, Robert Garland, treasurer.

Dear Sir.—We beg to acknowledge receipt of your inquiry regarding our experience in bending soft steel pipe such as furnished by you to us for conduit purposes, and take pleasure in stating in reply that the pipe furnished bends perfectly. We have used this pipe for a number of years and are constantly making bends of all kinds on sizes from ½ inch to 3 inches. Thousands upon thousands of elbows are being made by us on our elbow machine at the factory every month, and the loss due to splitting of the seam is so infinitesimal that we abandoned a long time ago keeping any record of it. We run for a month at times without a single length opening at the seam. The radius to which this material is bent varies according to the size of the pipe, but the ½-inch pipe when made into elbows is bent to a radius of about 4 inches. In addition to this we have seen a great deal of this pipe bent cold on the job without any appearance of opening, bent into any shape and form by the workmen who install the pipe, and we can state positively that we have had no complaint, for several years at least, of any length of pipe opening at the seam under these conditions.—AMERICAN CIRCULAR LOOM COMPANY, A. T. Clark, treasurer.

In bedstead tubing, although the weld is not guaranteed to stand this test, the percentage of failures is very small—less than 1 per cent. This sufficiently bears out mill tests previously given on the relative strength of welds made with steel and wrought iron.

Notwithstanding the great improvements already made in the manufacture of this steel in the comparatively short time it has been in service, no one acquainted with the possibilities of this material would venture to assume that there is nothing further to learn in adapting it to the needs of the trade.

The Master Steam Boiler Makers' Convention.

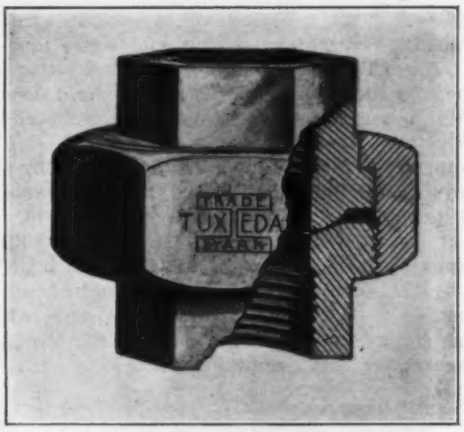
The following officers were elected by the Master Steam Boiler Makers' Association at its fourth annual convention, held at Chicago, June 5 to 8: President, W. M. Wilson, Chicago, foreman boiler maker, Illinois Central Railway; first vice-president, E. S. Fitzsimmons, Meadville, Pa., foreman boiler maker, Erie Railway; second vice-president, W. J. Ritchie, Memphis, Tenn., foreman boiler maker, Illinois Central Railway; third vice-president, T. W. Lowe, Winnipeg, Man., foreman, Canadian Pacific Railway; fourth vice-president, Wm. Horsley, New Haven, Conn.; fifth vice-president, P. F. Flagin, Laredo, Texas; sixth vice-president, M. Connors, Missouri Valley, Iowa; seventh vice-president, C. F. Lape, Chicago, with Scully Steel & Iron Company; secretary, Geo. M. Clark, Chicago; treasurer, Frank Gray, foreman boiler maker, Chicago & Alton Railway, Bloomington, Ill.; Executive Board: Chas. Patrick, Chicago, chairman; J. H. Smyth, Paterson, N. J.; P. J. Conrath, Chicago; C. J. Murray, Chicago.

Each of the officers made an address of acceptance, nearly all the addresses making favorable reference to the proposed consolidation of the association with the International Railway Master Boiler Makers' Association. The time and place of next meeting were left with the Executive Board. Resolutions were passed thanking the supply men for their entertainment, and a special resolution thanked the president of the Chicago Pneumatic Tool Company for the entertainment of delegates and their ladies during the convention.

The Chalmers-Williams Company.—A new and important industry in the Chicago district is being launched under the name of the Chalmers-Williams Company, at the head of which are Thomas S. Chalmers, a son of W. J. Chalmers, and Norman Williams, a son of Norman Williams. The first step in the development consisted of the purchase of the plant of the United States Railway Appliance Company, at Chicago Heights, Ill., a brick building, 100 x 200 feet. This building, which will be used for the present as a foundry and machine shop, will be augmented as soon as new structures can be erected with a new foundry building, 100 x 200 feet; a power house, 42 x 75 feet, and a blacksmith shop, 42 x 80 feet. A small pattern shop, 40 x 42 feet, already on the premises will be utilized for the same purpose by the new company. The present main building has installed in it two cupolas of 3-ton and 5-ton capacity, respectively, and has running overhead an electric traveling crane. Boilers have been purchased from the Milwaukee Boiler Company, and a 250 horse-power Fraser & Chalmers engine has also been secured. The new company will shortly be a large factor in the manufacture of Sederholm boilers, engines and mining machinery. Fritz Foltz, Chicago, is the architect for the new building. The company has secured the services of many men of the Allis-Chalmers plants, including Neut Posse, who has been head of the mining sales department for the Fraser & Chalmers Company, and who will have charge of sales of the new company; David Smith, who for years was superintendent of the Fraser & Chalmers Company, and will be superintendent of the new factory, and Michael O'Connors, from the same company, who will be foundry superintendent.

Tuxeda High Pressure Bronze Unions.

With a view to saving the annoyance and expense of leaky joints and repairs on high pressure steam pipe lines Franklin Williams, 41 Cortlandt street, New York, has placed on the market a line of bronze unions named "Tuxeda." These unions are designed to withstand a



The Tuxeda High Pressure Bronze Union.

pressure of 250 pounds of steam or gas and are guaranteed by the manufacturer not to spread or leak under this pressure. Both ends are of hexagonal shape for a smooth faced wrench. The threads are long and accurately cut. There is enough stock at every point to warrant tight joints, no matter how many times the union is used. No packing is required. The small seating surface between the ball nose and tapered seat insures a tight joint, even though the pipes are out of line. Screwed unions, if they are of heavy bronze, are more satisfactory than flanges, because of their convenience and the liability of flanges to crack and blow out packing.

On account of the Tuxeda union's unusual strength and durability it is especially desirable about blast furnaces, rolling mills and mines as well as on high pressure or superheated steam lines of power stations. These unions have been thoroughly tested under most exacting conditions and are now installed in a number of notable power stations, including those of the New York Subway at Fifty-ninth street, New York, and the Niagara Falls Power Company, Niagara Falls, N. Y.

The French Westinghouse Company has just closed an important contract for a railroad installation in Italy involving the use of quadruple 75 horse-power single phase motor equipments with the Westinghouse electric pneumatic control. The contract also calls for the erection of a power house and the complete line construction. The power house apparatus will be made by the French company at its Havre works, but the single phase motors and electric pneumatic control will be the same as already installed upon several lines in the United States by the Westinghouse Electric & Mfg. Company and will be supplied by that company from its Pittsburgh works.

The Mechanical Engineers' Convention.

An account of the opening of the fifty-first meeting of the American Society of Mechanical Engineers, at Scranton, Pa., Tuesday evening, June 6, was given in the last issue. This covered the professional papers presented that evening, but as the discussions of later papers were not available at the time of going to press only the titles and authors of the papers read Wednesday were mentioned. Beginning with the second session, Wednesday morning, the following covers the meeting to and including the excursions of Friday, officially the last day of the convention.

SECOND SESSION.

Wednesday morning at 10 o'clock in the auditorium of the Young Men's Christian Association Building the members convened for the second and business session. The secretary, Prof. F. R. Hutton, read the report of the tellers of the election of 124 new members on the last two ballots. The secretary also read an announcement concerning a congress of engineers to be held at the Lewis and Clark Exposition, in Portland, Ore., June 29 to July 1. The conduct of the congress will be principally in the hands of the Pacific Northwest Society and the Engineers' Society of the Pacific Coast, and several papers of special interest are promised by members of these societies. All engineers, architects and technical men are invited to participate. The society took no official action, but it was the opinion that some representative should be appointed to attend the congress.

With reference to the new Union Engineering Building Charles W. Hunt made a few statements. The society had 26 competitive plans submitted from which a selection has been made very much to the satisfaction of the committee, it being the belief that the best design in all particulars has been chosen. The specifications for the building are now in the hands of builders, who have been invited to bid, and on the 20th of this month the bids will be opened.

The election of Charles H. Haswell to honorary membership was announced by the president with a few words of gratification that this famous engineer, one of the last remaining to us from the previous generation, has been added to the roll of honorary members. Mr. Haswell only recently passed his ninety-sixth birthday, and is still quite active in his profession.

Chattanooga, Tenn., has been decided upon as the place for the next spring meeting. In making this announcement the president briefly referred to the attractiveness and historic interest attaching to that city, and spoke of its desirable qualifications as a meeting place for the society.

An incident of interest in connection with Mr. Haswell's election to honorary membership was related by H. H. Supplee, New York City, who described the circumstances through which he came into possession of a copy of the first edition of "Haswell's Pocketbook," printed in 1847, bearing on the flyleaf the inscription: "Presented with the compliments of C. H. Haswell to Captain John Ericcson." Mr. Supplee signified his intention to present this to the society's library.

The remainder of this session was devoted to the consideration of papers, the first of which was

"Microstructure and Frictional Characteristics in Bearing Metals,"

by Melvin Price, Lincoln, Neb. This recorded an investigation carried out in the mechanical engineering and metallurgy laboratories of Columbia University. The main questions considered were: The law of variation of the amount of friction with the velocity of sliding, other conditions remaining constant; Charpy's theory regarding the function of the hard grains and the plastic ground mass in the microstructure of alloys, and Professor Goodman's theory relating to the different effects in bearing alloys of elements of high and of low atomic volume. Regarding the first of these questions Morin affirmed that the force of friction is independent of velocity. Later investigators disagreed and attempted to substitute a law in which the range of ordinary working speeds is divided into three or more gradations, each having a separate characteristic for speed friction variation. Charpy found that the friction of hard substances was less than that of soft ones, leading him to believe that the hard grains in alloys supported the load, while the plastic ground mass caused the bearing to fit itself to the shaft. Goodman's deduction was that adding a third constituent to a bearing alloy containing the ordinary pure metals raised or lowered the friction according to the high or low atomic volume of the added metal.

The laws of friction announced by Morin were: The friction between two bodies is directly proportioned to the pressure—*i.e.*, the coefficient is constant for all pressures. The coefficient and amount of friction, pressure being the same, are independent of the areas in contact. The coefficient of friction is independent of velocity, although static friction (friction of rest) is greater than friction of motion. In direct contrast are the modern beliefs regarding frictional behavior stated by Goodman: The coefficient of friction for moderate pressures and speeds varies approximately inversely, as the normal pressure. The frictional resistance varies as the area in contact, the normal pressure remaining constant. At very low journal speeds the coefficient of friction is abnormally high, but as the speed of sliding increases from about 10 to 100 feet per minute the friction diminishes, and again rises when that speed is exceeded, varying approximately as the square root of the speed.

The author's conclusion from his own experiments is that, contrary to Morin's announcement, the resistance may not always be independent of velocity. He then proceeded to describe experiments to determine whether there is a definite law of dependence or whether the variation appears as characteristic of the given material. From a study of resistance curves and microstructure the conclusion was that an alloy's resistance performance seems to be peculiar to itself, although there are often partial similarities. It appeared that mechanical imperfections, microscopic structural features, hard crystals of chemical compounds and other "foreign" effects, which make up the lower orders of asperity, had a rather constant influence on the resistance, and that the higher orders exert resistances varying according to the microstructure. This investigation also seemed to refute Charpy's conclusion that the hard grains contribute all of the alloy's antifriction quality. Foreign substances introduced into an alloy tended to increase the resistance as the result of the formation of isolated hard crystals, and in a somewhat constant manner. The experiments also failed to support Goodman's conclusions. In closing the author stated his realization that what he offered could only be regarded as meager in its power to refute or confirm.

In discussing this paper Sanford A. Moss, Lynn, Mass., took exception to the author's statement in reference to the modern belief regarding frictional behavior, and preferred those advanced in a thesis presented to Sibley College, Cornell University, by H. F. Moore. The latter divided friction into three classes: Friction of oily solid on oily solid, called "solid friction;" that in which there is a complete film of oil between two solids, called "perfect film friction" (a matter of hydrodynamics and not of metallurgy), and a stage intermediate between the two above classes, in which there is a perfect film separating journal and bearing, and yet in which the friction is not so great and does not follow the same laws as in solid friction. This was called "intermediate friction," and was the class to which Mr. Moss assigned the author's work. He thought that consistent data for intermediate friction could only be obtained when there is complete flooding of the bearing with oil.

The author also submitted a comment hoping that the investigation, so far as it has proceeded, would be regarded as but tentative, and that all very positive statements, unless easily demonstrable by facts, could be taken only as opinions prompted by experience.

F. W. Taylor, Philadelphia, commended the paper for its interest and the painstaking which it evidenced, and hoped that as similiar experiments are of value, such careful work may be encouraged.

H. H. Supplee called attention to the Lowscher tests of friction made in Germany for high speed bearings, which are abstracted in the last edition of Thurston's "Friction and Lost Work." He considered it as an important point that temperature should be taken account of in such experiments.

The president referred to some experiments of his own and indicated the difficulty of removing all traces of oil from pieces to be tested for friction without lubrication.

The second paper of the morning,

"Cast Iron, Crushing Loads and Microstructure,"

was read in abstract by the author, William J. Keep, Detroit, Mich. In it were recorded crushing and tensile tests made by H. Diederichs, assistant professor of experimental engineering, Sibley College, Cornell University, and a report on microstructure by Albert Sauveur, assistant professor of metallurgy, Harvard University, and proprietor of the Boston Testing Laboratories. The test specimens of all tests were prepared by the author. The paper aimed to make more complete the so-called A. S. M. E. series of tests on cast iron recorded in previous *Transactions* of the society. This series of tests is valuable on account of its completeness and because a full chemical analysis was made of each size of test bar of each of the 19 series of casts. A table is given of crushing tests of bars 0.692 and 1.13 inches diameter, to correspond with tensile tests given in previous papers on the same sectional areas and the same iron. The length of these test pieces for crushing was three times the diameter. They were carefully turned to size and bedded with sheet copper. From these records a chart was prepared showing the same general variation in crushing strength for variations in size and in silicon that was found in earlier transverse and tensile strength tests.

The variation in structure between the edge and center of a round casting and the corner, side and center of a rectangular casting was shown in tables. While there does not seem to be any difference in the size of the grain under the microscope, even when magnified 500 diameters, yet there is a very great difference in strength. An interesting feature was that showing the difference in strength between a small and a large casting, as few realize that a variation in the size of a casting causes a greater variation in strength than a variation in chemical composition. The best form of test piece for crushing tests was given and the relation of strength to length of a test piece. The discussion of the microstructure and Professor Sauveur's report followed. Numerous reproductions of micrographs were shown. It was pointed out that to infer the physical or chemical characteristics of samples of cast iron from the structure of other samples, although cast at the same time and under the same conditions, is hazardous.

The paper passed without discussion.

"Smoke and Its Abatement"

was the subject of a very interesting paper by Prof. Charles H. Benjamin of the Case School of Applied Science, Cleveland, Ohio. As the author explained, the smoke nuisance has become serious in the Middle West and is likely soon to affect the East, as the supply of so-called smokeless fuels—anthracite coal, petroleum, natural gas, &c.—is limited, while the supply of bituminous coal is not, so that it will doubtless become the fuel of the future. It is abundant, cheap and burns readily even with a poor draft, making it a most desirable fuel. The problem for our engineers and lawmakers was given to be not how to prevent the burning of soft coal, but how to burn it so that the combustion shall not be a public nuisance. The discussion was then confined to the problem of abating the smoke from bituminous coal. It is impracticable to prevent the evil entirely; hence the use of the word abatement rather than smoke prevention or smoke burning. Smoke in the majority of cases can be easily abated, and while it may be made the source of profit to the owner of the plant the author considered this of secondary importance to the relief of the community. Objectionable black smoke was shown to be due to the imperfect combustion of the coal and its cause was explained at some length.

Following a summary of the damage inflicted by soft coal smoke the author outlined ways for its abatement, only three conditions being necessary for complete combustion—the proper temperature, the proper air supply and a thorough mixing of the air and the hydrocarbons. With gas, oil or powdered coal the last condition is easily obtained, but with coal of ordinary form means are required for varying the coal supply and the air supply according to the demands upon the boiler. When the firing is by hand steam jets or blowers were stated to be of advantage, but the author believes the best solution of the problem to be the introduction of mechanical means for handling the coal to give uniform feed and a corresponding delivery of air for combustion.

A discussion of various kinds of stokers followed. The author, to determine the sentiment of manufacturers using stokers, addressed letters to a number and in every case received favorable replies, both with regard to smoke abatement and general efficiency. For the benefit of those who are more convinced by expert tests the author inserted a summary of several tests on stoker fed boilers that had come under his personal observation and discussed them. The problem of abating smoke from locomotives was also treated, with some account of methods that have been tried, including the one-shovel system of firing, where the furnace door is closed between each shovelful. The author concluded with some remarks concerning the legal phase of the question and the duty of the public to assert its rights.

This paper evoked a considerable amount of discussion. A. Bement, Chicago, took a less optimistic view of the mechanical stoking apparatus at present on the market, stating that all of the devices are in a large number of cases making considerable smoke even under favorable conditions of fuel and manipulation. He favored the chain grate stoker, but considered it not sufficient in itself alone, because it does not produce the proper mixture of the gases with the air. His remedy with a water tube boiler is to cover the bottom row of tubes with a refractory tile which extends from the front to about 5 feet from the back end of the boiler, to form a furnace roof, forcing the gases to enter among the tubes at the back of the boiler. If the furnace is from 16 to 18 feet long, measuring from the point of entrance of the fuel to the exit, smokeless combustion will be produced independent of the manipulation. He wished to correct the inference in the paper that owing to the small opening in the chain grate a strong draft is necessary, as one cannot be operated with a very strong suction draft on account of the excessive leakage through the coal hopper, the usual limit being about 0.6 inch of water.

J. T. Hawkins, Boston, Mass., in his discussion cited tests to determine the possibility of burning bituminous coal without producing smoke and the actual loss due to the production of smoke only, other conditions being equal. The firing was by hand and it was found practicable to continuously burn the coal without smoke. As between smoky and smokeless firing the loss never exceeded 0.7 of 1 per cent. He therefore took exception to the author's position that the abatement of smoke can be made a material source of profit to the owner of the plant.

The experience of Geo. H. Barrus, Boston, has been that plant operators are willing to do what they can to abate smoke, until it involves too much outlay in apparatus.

A. J. Herschmann, New York, told of the results obtained in the plant of the Fuller Building in New York. Here mechanical stokers were taken out and mechanical draft was introduced. Soft coal was burned and it was found that one fireman could care for 450 horse-power of boilers. It was his opinion that stokers do not add much to the economy in office building plants, although they may in central stations, and that the smoke does not affect the economy.

Ambrose Swasey, Cleveland, commended the work of Professor Benjamin while city smoke official in Cleve-

land. His belief is that automatic stokers can eliminate smoke and that they should be applied if the boiler capacity warrants it. He has found that too much coal put in at one time is one fault and believes that 75 per cent. of the smoke in Cleveland could be abated by careful firing even when stokers are not used.

M. H. Miner, New York, speaking of locomotive firing, was of the opinion that locomotives are now built too big to permit of the one shovel method of firing. In a test of an Erie locomotive it was necessary to fire six or seven shovels at a time. Automatic stokers, he believed, would be the ultimate solution of this part of the problem.

W. H. Blauvelt, Syracuse, N. Y., referring to the economy of various equipments, mentioned three plants of essentially equal capacity, one equipped with the most modern apparatus throughout, including stokers, conveyors, &c.; one equipped in what would now be considered old practice, hand fired without special conveniences, and one of an intermediate grade, being hand fired, but provided with convenient handling apparatus. It was found that, all things considered, the expense of operating all was about the same.

F. W. Taylor stated that he had tried three types of automatic stokers and had been surprised to find no greater economy than with hand firing, possibly due to the fact that very high priced coal was used. His conclusion was that with poor coal the mechanical stoker has advantages in the saving of labor.

Commenting on the paper the president declared it to be one of the most important of the meeting and besought the members to apply themselves in conducting a campaign of education for smoke abatement.

In closing the discussion the author reaffirmed that steam and air jets are effective in abating smoke, and emphasized the justice of reducing the smoke nuisance even at added expense to the manufacturers, believing that the ethics of the question and the legal standpoint need take no account of the expense or economy.

EXCURSIONS.

For the sake of chronological sequence the excursions participated in Tuesday afternoon should have been included in the installment of the convention report printed in last week's issue. One of these was a

Visit to the McClave-Brooks Company's Works.

This company manufactures McClave stokers, shaking and cut off grates and Argand steam blowers, all of which are appliances adapted for burning the cheaper grades of fuel, such as bird's-eye and rice sizes of anthracite, bituminous slack, screenings, duff, coke breeze, &c.

The Pine Brook Breaker

was another of the points of interest visited that afternoon. The Pine Brook mine has been in operation between 40 and 50 years. Its capacity is 2000 tons of prepared coal per day, and includes all sizes from lump to buckwheat No. 3. The depth of the shaft is 300 feet, and the distance from the surface to the top of the hoisting tower is 190 feet. There are four electric locomotives in the mine and two more will be added shortly. About 1000 men are employed in the mine and breaker.

Wednesday afternoon an opportunity was extended to inspect the buildings and systems of

The International Correspondence Schools.

This institution offers 200 courses, covering all branches of engineering. It has enrolled nearly 800,000 students, and its methods of teaching by mail and of preparing text books were of special interest. Elaborate filing systems are used for keeping the history of each student readily accessible. The method of teaching foreign languages by phonograph and the methods of teaching the arts and crafts perhaps attracted as much attention as any other branches of the work. There are two buildings, an administration building and a printery. The latter is one of the largest in the country and is equipped with electrically driven and automatically operated machinery, including electrically controlled automatic presses; a Harris press, printing 100 envelopes a minute; Monotype machines, setting and casting 4500 characters an hour, and many other special machines.

From this point the visitors were conducted to

The Allis-Chalmers Works,

at Penn avenue and Vine street. In this department of the company blowing engines, hoisting engines, Corliss engines for mills and electric generating, mining machinery and sugar machinery, are built. A part of this shop is equipped with direct connected electrically driven tools, and the remainder of the equipment is driven by line shafts from motors. It afforded an interesting comparison between the two systems. The erecting shop was built especially for erecting large engines, such as the steeple compound blowing engines, two of which in course of erection were to be seen on the occasion of this visit. The plant employs about 600 men.

THIRD SESSION.

The first paper Wednesday evening was a short one relating to a much mooted point,

"Can a Steam Turbine Be Started in an Emergency Quicker Than a Reciprocating Engine of the Same Power?"

by A. S. Mann, Schenectady, N. Y. The author's contention was that it can, in support of which he describes a plant equipped with three Curtis turbine driven alternators of 1500 kw. capacity each, where the whole time consumed from the signal calling the crew to their posts to the instant that the turbine is running under full load is two and one-half minutes. In contrast to this he states that to bring a reciprocating engine of that capacity to full speed and load would require not less than 10, and more often 15, minutes. That this performance can be repeated frequently he cited from a log which showed that out of 43 such calls 10 starts were made in 2½ minutes, 18 in 3 minutes and 15 in 3½ minutes. Of course it is to be understood that such records are only possible with a well trained force of attendants and a specially contrived system. The account of the system, going into the details of its operation in the boiler and engine rooms, was interesting in the extreme.

Supplementing the information contained in the paper, R. H. Rice stated that such starts may be made daily without injury to any part of the machinery. He also mentioned that a new machine on test had been gotten up to speed in 15 minutes where all of the special provisions that the author describes were not in force.

"Note on the Efficiency of Steam Generating Apparatus"

was the subject of the next paper, presented by A. Bement, Chicago. This contribution was suggested by the discussion of a paper entitled "More Exact Methods for Determining the Efficiency of Steam Generating Apparatus," read by the author at the last annual meeting and covered in the report of that convention in *The Iron Age*, December 15, 1904. The author emphatically distinguished boiler efficiency from that with which it is frequently confounded, the efficiency of the boiler and furnace combined, defining the true efficiency as that due to the features of shape and arrangements of parts in the metallic structure constituting the boiler proper. In differentiating the two the paper treated of furnace efficiency, the furnace, the grate and stoker, manipulation and an efficient boiler.

In the paper by the author referred to above results of tests were given of two boilers differing much in efficiency. As no drawings accompanied that paper it was not clear to what type the tests referred. For this reason illustrations showing them were included in the present paper. Originally the boilers were identical, but one was modified by changing the gas travel by inserting two baffles, which greatly increased the efficiency. Tests of the two boilers in greater detail than were given in the original paper followed. The author considered that these boilers represent the extreme ranges of efficiency possessed by what would be called first-class boilers, and it is his opinion if such or corresponding boilers be served with a very good fire the resulting efficiency produced through them will equal a fuel saving of 10 per cent. for the better over the poorer at a capacity of 1 horse-power developed per

each 10 square feet of heating surface, and this would be the minimum measure of value between them. But as the condition of combustion becomes poorer the effect of the value of a more efficient boiler becomes greater, and a purchaser would always realize benefit from it, which would not be the case with a good furnace and stoker over poor ones, unless properly operated.

Discussing the paper, Prof. William Kent, Syracuse, N. Y., thought that the author's criticism of the present definition of boiler efficiency was unwarranted, as the society's rules take account of the distinction.

A discussion by A. A. Cary, New York, was also to the effect that the efficiency of a boiler should be distinguished from the combined efficiency of furnace and boiler. He affirmed that true boiler efficiency varies with design and also with the temperature and quantity of heat supplied by the furnace, and defined the performance of an ideal boiler. Poor efficiency he considered due to insufficient heat absorbing surface and improper disposition of furnace gases, the latter being probably the principal cause. For high efficiencies the gases should envelop the whole heating surface uniformly throughout their course, and there should be no cold pockets nor dead spaces. The drop in temperature of the gases should also be uniform and gradual. High furnace temperatures are also necessary to high efficiency. In a furnace of highest theoretical efficiency, Mr. Cary stated, all heat contained in the coal has been generated in the furnace, and as perfect combustion cannot be realized in the presence of an excess of air, the weight of the gaseous products must be a minimum and high temperatures must result. Grates, he added, have much to do with furnace performance and can hurt an otherwise good furnace.

A. J. Herschmann, again referring to the plant in the Fuller Building, said that increased economy was effected after the application of mechanical draft, to the extent that the coal bill was reduced from $12,000 to $8500, and allowing for all additional expense, including interest on the investment, there was still a saving of 24 per cent. In this connection Professor Kent expressed the opinion that comparisons before and after adding improved devices should not be made in terms of efficiency, as they are misleading. Relative to boiler efficiencies he stated that with hand firing and natural draft results were produced at the time of the Centennial Exposition that have never since been exceeded nor ever will be. Mr. Herschmann added that in the results he had referred to it would not be fair to compare boiler efficiencies, as before the changes soft coal was used and after No. 2 buckwheat, nor did he intend that they should be accredited as a result of any device alone.

The next paper was by the same author,

"Performance of a Superheater."

The apparatus consisted of a Babcock & Wilcox boiler of approximately 5000 square feet of heating surface, of a hight of 14 tubes, and a Babcock & Wilcox superheater of approximately 1000 square feet of heating surface, served by a chain grate stoker with a grate area of 75 square feet, which discharged the gases of the fire from under an ordinary short ignition arch directly among the tubes of the boiler. Diagrams were shown plotted from a large number of experiments. A great variation in capacity was produced due to the size of the coal used by the stoker and the amount of ash it contained. One of the curves showed the relation of the degree of superheat to the total horse-power developed, from which it was apparent that the capacity increases at a much greater ratio than the steam temperature; in other words, the temperature tended in a measure to remain constant. A second curve showed the relation between the horse-power produced in the boiler and the superheater, a third the relation of degrees of superheat to horse-power produced in the superheater, and a fourth the percentage of horse-power produced in the superheater to that developed in the boiler. In calculating the work developed in the superheater the specific heat of superheated steam was taken as 0.75, although, according to the author, a higher figure is probably nearer correct, as the steam pressure was 180 pounds.

Discussing the paper, George H. Barrus thought that if the specific heat does increase it is less than the author affirms. He also questioned the superheater having any such advantage as the author indicated.

In the absence of the author of the next paper on the programme, Professor Jacobus, it was deferred until the next session.

The last paper of the evening was

"Steam Actuated Valve Gear,"

by William H. Collier, Jackson, Tenn. Quoting from the author's introduction, "Attempts to secure a perfect distribution of steam by mechanically operated valve gears have necessarily resulted in complicated mechanism and excessive friction in these parts and usually limit the rotative speed of engine, while the point of cut off in most cases is limited to one-half stroke with a constant point of compression." These objectionable features, it is believed, have been overcome by the engine described in this paper, and, aside from simplicity of construction and increased economy due to high rotative speed and minimum clearance, the following advantages are claimed: Perfect distribution of steam, all movements of valves full and instantaneous, cut off varying under control of governor from no load to full stroke, and variable compression; closer regulation as governor has absolutely no work to perform, but merely indicates point of cut off; no safety device necessary, as the speed limit is governed by velocity of steam through admission port of governing valve, making it absolutely impossible for speed of engine to increase 50 per cent. above that for which it is designed; a higher rotative speed of engine, speed of engine being limited by piston speed only; engine reversible, may be made to run in either direction, started or stopped by means of sliding key; a valve gear in which it is impossible to get valves out of adjustment; a more economical valve gear, doing away with friction and weight of releasing gear, dash pots, rocker arms, eccentrics, &c., steam on actuating pistons being used expansively.

The paper proceeded with a description of a 14 x 30 inch engine running 100 revolutions per minute, developing from 80 to 120 horse-power, which has been in operation ten hours per day for the last six months in the power plant of the Southern Engine & Boiler Works. The construction of the steam actuated valve gear was then explained in detail with reference to sectional drawings, followed by an account of its operation. A gear embodying the same features is now being applied to an air compressor, and the author stated that it is believed that its application to compressors is even more desirable than to engines. The principles of the valve may be adapted to any stationary engine or locomotive having two or more valves.

The paper was discussed by F. M. Rites, Ithaca, N. Y., who pronounced the new mechanism very interesting and a distinct advance in the art of engine designing. He hoped that the author might give an actual indication of the practical limit of speed of an engine so equipped.

H. H. Supplee recalled a steam thrown gear used on a Babcock & Wilcox engine some years ago which was finally discarded on account of faulty construction; consequently the steam gear is not new. Professor Kent asked that the paper be given more discussion before it is inserted in the *Transactions* of the society. It was the opinion of R. H. Rice that the gear is not as good as represented and that it would be of short life.

CLOSING SESSION.

The last professional session was held Thursday morning, the first paper being

"Note on Heads of Machine Screws,"

by H. G. Reist, Schenectady, N. Y. The principal import of the paper was the recommendation of a standard design for round, fillister, flat and hexagon head machine screws.

L. D. Burlingame, Providence, R. I., supplemented the paper by outlining the standards in use by the Brown & Sharpe Mfg. Company. These are somewhat simpler, as there are three standard forms of heads instead of the four described by the author.

The subject of the next paper was

"Belt Creep,"

presented by William W. Bird, Worcester, Mass. As the paper stated, the question of the minimum amount of slip of a belt in transmitting power from one pulley to another reduces itself to a question of creep, for it is possible to have belts large enough so that with proper tensions there will be no regular slip, but with a difference in tension on the two sides and elasticity in the belt creep is bound to take place. That which followed recorded an investigation into what this creep amounts to and what allowance should be made for it. The following formulas were given:

$$x=\frac{v_1-v_2}{v_1},\quad \frac{v_1}{v_2}=\frac{1+s}{1},\quad \frac{E}{t}=\frac{1}{s},\quad x=\frac{s}{1+s}=\frac{t}{E+t}$$

in which x is the per cent. of slip; v_1, the pitch velocity of the driver; v_2, pitch velocity of driven pulley; t, difference in tension of the two sides of the belt per square inch; E, modulus of elasticity, and s, stretch in 1 inch of belt due to t. A table was also given of the per cent. of creep for various tensions and values of the modulus of elasticity. For determining the values for the modulus a belt testing machine in the engineering laboratory of the Worcester Polytechnic Institute was used. The results obtained were tabulated.

The paper illustrated a model for showing creep, which was exhibited at the meeting. It had two pulleys of the same size, one connected to a dial and the other by gears and shafts to a pointer on the dial. The driver was turned by a crank and pinion, while a brake on the driven pulley supplied the load. In this way the creep was shown, and by using an elastic band the driver might be run twice as fast as the driven without regular slip. It was found that the modulus of elasticity of leather belting was a very uncertain quantity. That it varies in actual working condition has been proved by numerous experiments reported to the society, which show that the sum of the tensions increases with an increase in the difference of tensions or load, the distance between centers remaining constant. The conclusion from the experiments was that for the common leather belt running under ordinary conditions the creep should not exceed 1 per cent. While this is sometimes called legitimate slip, it is an actual loss of power and cannot be avoided by belt tighteners or patent pulley coverings.

"The Function of Laboratory Courses in the Curriculum of Engineering Schools,"

by Charles E. Lucke, director of the experimental laboratory, Columbia University, New York, was a paper that elicited many comments. The discussion contained in the paper was provoked by the diversity of methods employed in the various technical schools in this country and also partly by the criticisms of investigators from abroad who have studied our systems. The author agreed with the statement once made by Professor Armstrong of England: "We should adopt the plan of training students from the research point of view, from the point of view of developing their thinking power and their originality." This was made the keynote of the treatment of the subject. It seems to be the general opinion that, while our laboratories are conceded to be excellently equipped, it is a question if they are used to the best advantage. Other opinions were invited, particularly with respect to these points: What should be the aim of the technical work dependent on laboratory instruction? Can there be more than one legitimate aim in our technical schools? What should be the method of such instruction to best accomplish the aim and justify the use of the machinery and instruments of a laboratory?

For convenience the author grouped the possible results of experimental laboratory instruction under four headings: To teach the student how to make the standard commercial tests, such as he may be expected to exactly repeat in his future professional life; to judge and criticise existing data on record in books and journals; to judge the limits of practical performance for machinery of all classes and to know to what degree losses of energy may be reduced or results desired improved by perfection of design, and how to approach a new problem, and by the application of a method of attack to make certain either a solution or the impossibility of solution, or, in other words, how to carry on research.

Continuing, the author defined the limits of present methods of laboratory instruction, the one where everything is supplied to the student and he has little thinking to do for himself, and the other where he is simply told the problem and left to work out his own solution by pure research. An example was given of a problem presented in each of these ways. The remainder of the paper was largely an elaboration upon a modified research basis for conducting laboratory instruction and outlined the author's practice, covering the work to be done before the experiment, the work to be done during and after the experiment and a few specimen problems.

The discussions were in the main indorsements of the author's argument. A. Bement asserted that it is more important to develop in the student the ability for clear and correct thinking and method for analysis than to supply him with a store of information and a limited amount of experience which can have no exact application in subsequent practice. He believes there is a greater competition among American colleges toward the acquisition of laboratory equipment than for excellence in teaching method.

Hugo Diemer, Indianapolis, Ind., criticised the tendency in the average engineering school to crowd the students too much, and for the sake of display to give them work of an elaborate nature beyond their capacity, when simpler experiments would quite as well develop their thoroughness and individuality.

Prof. A. L. Williston of Pratt Institute, Brooklyn, N. Y., gave it as his opinion that experimental work is most important in that it gives the best preparation for practical engineering and commended the author's paper generally.

Prof. D. S. Jacobus, Stevens Institute, Hoboken, N. J., also approved the paper. He considers that too much system is worse than too little.

Comparing European and American methods, H. H. Supplee credits the former with carrying original work further than the latter. He believes that follow up problems have their place in laboratory work, using the students as assistants and obtaining contributions to engineering knowledge.

"Continuous Measuring and Mixing of Crushed or Powdered Materials in Accurate Proportions."

This next paper, by E. N. Trump, Syracuse, N. Y., particularly pertained to methods of measuring and mixing materials in large quantities for chemical and metallurgical processes where it is necessary to get intimate association by mixture until the particles are near enough to admit of the desired reactions. It covered the "batch method," where the ingredients are weighed in convenient sized "batches" and brought together in a mixing machine. Under the heading "Continuous Measuring and Mixing" it described screw conveyors, shaking spouts, revolving pockets, revolving rolls, reciprocating tables and revolving tables. The revolving table with a stationary spout above its center is considered the most accurate and is much used in cement manufacture for feeding mills, &c. The author discussed its defects and means for correcting, showing drawings of suggested apparatus, which were described in detail. The mechanism so dwelt upon may be employed for the feeding of a great variety of materials, varying considerably in size and consistency, and examples of its use were given. The measuring and mixing of concrete with machines for doing it occupied a large part of the paper.

An entertaining paper of historical interest was that presented by Rear-Admiral George W. Melville, entitled

"Epochs in Marine Engineering."

As inventions which marked these epochs the following were considered: The paddle wheel, the screw propeller, the surface condenser, the cylindrical boiler, the compound engine, the advent of mild steel, forced draft, high engine speed, the multiple expansion engine, water tube boilers, auxiliaries and the steam turbine.

The paper was discussed by A. Bement, who thought that the trouble with the Belleville boiler in the British

navy was not due to lack of familiarity with it, as inferred in the paper, but with the boiler itself. If criticism is justified, he believed it due to its adoption rather than its management.

An interesting supplement to the paper was that offered by John T. Hawkins, Boston, Mass., whose service in the Navy was contemporaneous with that of the author's up to 1869. He particularly dealt with the advances involving the use of steam expansively, which he termed the most epoch making feature in marine engineering. The brief history which was given recalled much that is forgotten or unknown to the present generation concerning the work of the engineers of that time, including Sickels, Dickerson and Isherwood.

The paper deferred from the previous session,

"Counterweights for Large Engines,"

was the concluding one of the meeting, and was read in abstract by the author, Prof. D. S. Jacobus. It was a very complete account of the investigation and solution of the problem of lessening the vibration of the engines at the new power plant at the Manchester street station of the Rhode Island Company, Providence, R. I., upon which the author worked conjointly with Fred. N. Bushnell, the chief engineer of the company. The manner in which the vibration was corrected was notable for its boldness, as it consisted of adding exceptionally large counterweights to those already on the engine. The engines were built by the Filer & Stowell Company, Milwaukee, Wis., and were of the horizontal cross compound type, directly connected to electric generators. Two were driving 1500-k.w. alternating current generators and one a 1600-kw. direct current generator. On the first two engines counterweights were placed on the crank disks and in the revolving fields, and on the third engine on the crank disks and in the fly wheel. The seismographic measurements of the vibration of the chimney stack and the foundations of the building and engines before and after the application of the counterweights showed the complete success of the remedy. The paper had a valuable appendix giving the computations for the size of counterweights required and the angular displacement of the revolving fields of the alternating current generators when run in parallel. The paper was concluded with a note on a paper presented at the last meeting by Sanford A. Moss on "The Influence of the Connecting Rod on the Engine Forces."

F. N. Bushnell presented a discussion supplementing the paper, giving additional data relating to the nature of the soil upon which the plant stands and the construction of the foundations. He stated that the cost of applying the counterweights was only about 2½ per cent. of the estimated cost of carrying the foundations to hard bottom, as would otherwise have been necessary.

F. M. Rites defined the problems of vibratory forces as most serious and intricate and congratulated the author on solving his problem so easily. He explained that in some cases it is very difficult to locate the source of vibration, mentioning an experience of his own where the eventual remedy was the placing of a muffler on the exhaust.

George H. Barrus was pleased with the character of the paper and suggested the desirability of members furnishing just such narratives of work they have performed for the benefit of their fellow members. R. H. Rice described some of his investigations on counterweights.

Conclusion of the Meeting.

The secretary announced that the summer of 1907 will be the one hundredth anniversary of Fulton's "Clermont," built in 1807, and that a centennial commemorating it has been proposed and approved by the Council. Resolutions of gratitude to those who had contributed to entertaining the society were passed.

THURSDAY EXCURSIONS.

Thursday afternoon a special train, furnished by the Delaware, Lackawanna & Western Railroad, conveyed the members and guests to the car shops and local coal mining enterprise of the company. The Lackawanna car shops known as

The Keyser Valley Shops

were opened last January. The plant is designed exclusively for freight car construction and repairs. The buildings are all of brick and include a power house, 50 x 180 feet; planing mill, 90 x 400; blacksmith shop, 80 x 300; machine shop, 30 x 180; two erecting shops, each 150 x 400; paint shop, 60 x 220; paint shop annex, 20 x 280; storehouse and office building, 44 x 105, together with various smaller auxiliary buildings. All power is furnished by two 300-kw. and one 100-kw. General Electric Company generators, driven by Ball & Wood cross compound engines, the steam being supplied by 1200 horsepower of Stirling boilers.

The Hampton Central Power Plant.

The central station for the Hampton mines consists of a boiler plant containing 15 313 horse-power Babcock & Wilcox boilers, generating steam at 150 pounds pressure, served by McClave stokers with forced and induced draft and a Green economizer. Coal is dumped into the pockets directly from cars and ashes are flushed down a bore hole. The power plant contains five 500-kw. 2300-volt three-phase 60-cycle Curtis turbine driven alternators. It furnishes power to seven substations and a water hoist.

The Hampton Water Hoist,

now nearing completion, is automatic and electrically operated by an 800 horse-power motor. It is being built by the Wellman-Seaver-Morgan Company, Cleveland, Ohio, and has two buckets, each having 17 tons capacity and operating through a lift of 500 feet. A complete cycle of one bucket is made in 1 minute and 55 seconds.

RECEPTION.

Thursday evening a very delightful reception was given by the local members of the society, together with the Scranton Engineers' Club, the Board of Trade and the citizens of Scranton, to the officers, members and ladies of the society, at the Scranton Bicycle Club. Although this marked the formal closing of the society's visit, many members remained over for the excursions of the following afternoon.

FRIDAY EXCURSIONS.

In the morning at 9.30, a special train of the L. & W. V. Railroad Company left the Scranton terminal, and, stopping for a brief inspection of the power house, proceeded to Wilkes-Barre.

The Laurel Line,

as this is popularly known, is a double track third-rail electric road, about 20 miles long, connecting Scranton and Wilkes-Barre, and has a branch 1 mile long from Scranton to Dunmore. It is equipped with 90-pound rails laid in accordance with railroad specifications, and makes use of the third rail most of its length, which is private right of way except for a small distance into Wilkes-Barre, where the use of a trolley was compelled. The road is stated to handle 300,000 passengers a month. It is owned and was constructed by the Westinghouse Companies, largely to be a typical example of the most modern electric railroad practice. It has as special features of interest the Scranton power station, the Hancock substation, the Avoca viaduct, 682 feet long; the ravine approaching Pittston, inclosed by concrete masonry; the Prospect viaduct near Wilkes-Barre, 552 feet long, and the extensive use of concrete along the line.

The Scranton Power House.

The power house in Scranton is divided by a brick wall into a boiler room and an engine room. The steam plant can accommodate seven 400 horse-power Babcock & Wilcox boilers, five of which are in place, supplied with Roney stokers. Coal is fed from an overhead bunker, and blowers are used when culm is the fuel. The engine room can accommodate three engines, two of which are in place. These are Westinghouse vertical cross compound with Corliss valve gears. They operate the generators in multiple. Double current generators are used, furnishing alternating current at 390 volts and direct current at 650 volts. There are four 800-kw. transformers, which raise the pressure from 390 to 2200 volts. The substation at Hancock converts the current to direct form and reduces it to 650 volts.

Arriving at Wilkes-Barre the party was served with luncheon at the Hotel Sterling, and at 1.30 took special cars provided by the Wyoming Valley Traction Company to visit various local points of interest.

The Vulcan Iron Works,

South Wilkes-Barre, was one of the places visited. The product manufactured here includes hoisting engines, light locomotives and a general line of mining machinery.

Another point visited was

The No. 5 Colliery

of the Lehigh & Wilkes-Barre Coal Company. The mine proper of this colliery is very extensive, being some 2 miles east and west and 1 mile north and south. The openings comprise one hoisting and ventilating shaft 1039 feet deep, one hoisting shaft 968 feet deep and an air shaft 967 feet in depth, located 6000 feet west of the hoisting shafts. The surface operations consist of a breaker for the preparation of coal, two boiler plants, seven pairs of hoisting engines, one air compressor, four 35-foot Guibal fans, small shop, saw mill and other necessary buildings and equipment. The average output per nine-hour day at the present time is approximately 1800 tons of coal of all sizes. One hundred and fifty men and boys are employed on the surface and 600 men in the mines.

The Hazard Mfg. Company,

among the largest manufacturers of all kinds of cables and wire ropes for haulage, hoisting and transmission purposes, as well as insulated electric wires and cables, was visited by many of the party. One of the interesting exhibits here was what is probably the largest single cable that has ever been made. This was a 2½-inch left handed lay cable 5800 feet long. Various processes were demonstrated, including single drawing of iron wire, multiple pass drawing of copper, multiple tinning of wires, insulating wires with cotton and rubber and the twisting of copper lightning rods from many individual wires.

A party was also conducted through

The Sheldon Axle Works

in North Wilkes-Barre, where a general line of axles and springs for buggies, wagons and other vehicles is manufactured.

Final Registration.

Including members and their wives and guests 315 were registered during the meeting.

The annual meeting of the society will be held in New York City December 5 to 8, 1905.

American Machinery in Mexico.

United States Consul A. J. Lispinasse, at Tuxpam, Mexico, comments in his annual report on the status of the machinery trade in Mexico. He considers it strange that American machinery is not exclusively employed, and says that the Mexicans engaged in agriculture and mining seem to prefer English and German makes. As if to point out that Consul Lispinasse has overestimated the amount of European machinery imported into Mexico, the Bureau of Statistics, Department of Commerce and Labor, presents the following statements compiled from British and American official publications, showing the exports of machinery and implements from the United Kingdom (calendar year) and the United States (year ended June 30) to Mexico in 1903:

United Kingdom.—Implements and tools, $170,566; locomotives, $70,905; agricultural steam engines, $47,462; other steam engines, $140,773; mining machinery, not steam, $25,856; textile machinery, not steam, $247,306; other machinery, not steam, $318,537; all other machinery, $23,194; total, $1,044,599.

United States.—Agricultural implements, $330,910; machinery, machines and parts of, not otherwise designated, $4,755,095; sewing machines, $490,238; steam engines, and parts of, $1,692,622; total, $7,262,865; total British, $1,044,599; excess of American machinery, $6,224,266.

In addition to the foregoing American builders' hardware, saws and tools to the value of $704,601 were exported to Mexico during the year. There are no available statistics at hand covering the exports of machinery from Germany to Mexico.

An Eight-Hour Day on the Panama Canal.

WASHINGTON, D. C., June 13, 1905.—The Attorney-General has prepared an opinion of far reaching importance dealing with the application of the eight-hour law of 1892 to the construction of the Panama Canal. While the question immediately under consideration is simply whether the law applies to laborers and mechanics working on the canal and on the Panama Railroad, the Attorney-General lays down certain broad principles that have a direct bearing upon some of the most important questions that have been raised in connection with the so-called Gompers eight-hour bill, which has been pending in Congress for the past six years and which will be reintroduced at the beginning of the next session. With regard to the specific inquiries presented by the Panama Canal Commission, the Attorney-General holds that the law applies to all persons coming within the category of laborers or mechanics working on the canal, but it does not apply to the Panama Railroad for the reason that the extent of the Government's ownership of that road is limited to that of a stockholder in a regularly chartered corporation.

Bearing on the Gompers Bill.

It is, however, in the subsidiary questions considered by the Attorney-General that the chief interest lies from the standpoint of manufacturers who are opposed to a federal eight-hour law affecting work done for the Government by contract. Two of these questions are of special importance—namely, whether Congress has the right through the medium of contract to extend the regulation of the hours of labor beyond the actual territorial jurisdiction of the United States and whether in the application of an eight-hour law its terms shall be so rigidly construed as to prevent any employees, such as those who are engaged in preparing the day's work for others or in cleaning up after a shut down, from working a few minutes beyond the limit. In ruling on these questions the Attorney-General declares in comprehensive terms that Congress has full power to regulate the terms upon which its work shall be done, whether within or without the jurisdiction of the United States, and that if the employees referred to are actually laborers or mechanics the law must be strictly construed as limiting their work to eight hours in any one calendar day. As to this second point, however, the Attorney-General is plainly conscious of the embarrassments likely to result from the construction which he suggests and he intimates that inasmuch as the law is confined to laborers and mechanics, "some other designation of their employment" may be found for those workmen whose duties require them to begin their day earlier and end it later than the main body of employees.

The Attorney-General's opinion, taken as a whole, greatly emphasizes the importance of an energetic campaign on the part of manufacturers against the enactment of the Gompers bill, first, because it is obvious that in the view of the Attorney-General such a law, if enacted, would be held by the courts to be constitutional; and, second, because it appears to be exceedingly doubtful whether the exigencies of the daily operations of the average manufacturing plant could properly be regarded as coming within the exemptions provided in the Gompers bill.

W. L. C.

Joseph T. Richards, chief engineer of maintenance of way of the Pennsylvania Railroad, has made the following statement of objections to steel cross ties: They increase expansion and contraction in all parts of the track; they weigh about one-half as much as wooden ties and do not make heavy enough track; the connection of metal and metal between the rail and the tie is very detrimental; they are noisy; they have not the elasticity or cushion that a wooden tie has; they cost more; they could not be used where our automatic signals are used, because they would connect the current between the rails; lastly, there is no difficulty in getting all the wooden ties we require, and the greatest standard road in England (the London & Northwestern) is now getting 21 years of life out of cross ties by creosoting them at a cost of 15 cents per tie.

Some Retort Coke Melting Ratios.*

BY C. M. SCHWERIN, MILWAUKEE, WIS.

During the writer's experience as demonstrator for one of the by-product coke companies it has been his good fortune to have charge of cupolas of many various styles, melting iron for all classes of work; and as the question of melting ratio is of interest to foundrymen, the results of some tests are here given. By-product coke is coming so rapidly to the fore and is replacing beehive coke to such a marked degree that foundrymen all over the country, even when out of the district supplied by the present by-product companies, no doubt are interested.

Many statements have appeared in books and journals of the amount of iron that coke would melt, but the exact melting ratios under ordinary working conditions of the foundries have been very hard to obtain, as a melting ratio for proper foundry operation is not what the coke will do when driven to the limit, but is that ratio at which the coke will give hot fluid iron adapted to the work being poured. Many foundrymen will tell of some excellent work they have done or about a high ratio which upon close investigation proves to be erroneous. In many cases the bed has been left out of the calculation; in others a certain number of pounds has been estimated to make up a bushel; while again some simply take the cupola record as turned into the office without verifying the actual weights. An extra shovel or fork full for good luck, that many cupola tenders are prone to throw in without recording, exerts quite an influence on the amount of coke consumed. In this article the aim will be to give exact figures of a number of heats which were run under the writer's supervision. All weights of both coke and iron were actual scale weights, with no allowances of any kind.

It must be borne in mind that in every instance the cupolas used were in shops unfamiliar to the demonstrator, and in no instance in his charge more than three days. In some cases better ratios could have been obtained by carrying on the tests further, gradually reducing the quantity of coke until the limit of safety was reached.

False Economy in Using Coke.

It is my firm belief that coke is one of the most expensive things to economize on about a foundry. It is very poor policy to make an apparently fine ratio without taking into consideration the percentage of bad castings due to poor iron. It is always good practice to use an excess of coke, as "saving at the spigot and losing at the bung hole" does not increase profits. It pays to have hot iron for many reasons: 1, It cuts off the molders' favorite excuse for bad castings; 2, it enables small gates to be used on light work, giving clean castings and an easily detached gate and a smaller proportion of remelt; 3, iron is more easily skimmed when pouring and slag kept back; 4, if a slight accident happens, such as the power shutting down, there is a margin of safety to work with.

Another thing to be borne in mind when comparing ratios, in addition to the thinness of castings to be poured, is the chemical composition of the metal. High phosphorus, high carbon or high silicon iron will stay fluid much longer than low phosphorus, low carbon and low silicon iron. High sulphur in coke will make an iron set quickly, even though it comes hot from the cupola. Doubtless many readers of this paper will recall some experience of two years ago during the coke famine that will bring this fact home to them.

The so-called "semisteel" mixtures, which are simply low silicon, low carbon cast irons high in manganese, set very quickly, as every man who has ever had to keep ladles in repair in a foundry pouring this metal will testify. The proportion of scrap to pig iron and the size of both affect the melting ratio and the speed of melting, and both are constantly varying. This is another reason for keeping on the safe side in regard to the quantity of coke used.

* A paper read before the American Foundrymen's Association, New York, June, 1906.

Most of the heats here recorded are really too small to show the best total ratio, as the bed enters in as too prominent a factor; but the figures are representative of the majority of the shops of this country, as the big melter is the exception and not the rule.

Our experience has shown that a high coke bed gives better net result than starting with the often recommended 18 inches above the top of the tuyeres. This seems to be a disputed question, however, and the writer would appreciate information in regard to the actual experience of others. By running the bed high less coke by far may be used on the subsequent charges; once the bed burns out and melting commences too near the tuyeres trouble begins. Many no doubt have noticed the rush of slag at the end of a heat even when no flux has been used. When this happens it is invariably found that melting took place very near the tuyeres, causing the blast to oxidize the iron excessively. Not only is this a disadvantage because of the amount of coke used and trouble with slag, but the iron resulting will be harder than if the melting was done at the proper place, due to the oxidization of silicon, carbon, &c. Those who had the good fortune to witness the tests on coke conducted at the Model Foundry in St. Louis no doubt saw this point nicely illustrated. The bed in those tests was brought only 8 inches above the top of the upper tuyeres. On heats of about 3000 pounds the oxidization was very heavy and slag just poured in a liquid stream out of the slag hole, and the iron lost in melting was found to be very high indeed. For these tests this method of running was of course all right, as comparative data of various cokes under the same conditions were what was sought, and the tests were very painstakingly and carefully conducted under the supervision of Dr. Moldenke.

In running a cupola to get the most economical results it is found that the bed should be lighted up as late as possible and that the blast should be put on as soon as feasible after the cupola is charged full of iron. In burning the bed it is a good plan to put only a portion of the coke on the wood before lighting, and as the flame shows through the remainder of the coke should be charged. As soon as all the wood is burned out, and the blue flame appears through the top of the bed coke, all tuyeres should be closed and charging of iron begun. Just before putting on the blast it is advisable to open one tuyere in order to prevent any possibility of a gas explosion, this tuyere to be closed, of course, after the blast has been on a minute or so.

Another point to be considered is the running of a cupola with only one row of tuyeres instead of with two. The cupola with only the lower row will run more economically as far as coke consumption goes, and less difficulty would be experienced in the burning out of the brick. Of course a cupola with two rows of tuyeres melts somewhat faster with both rows open than if only the lower row be used, but if the lower row be enlarged the same speed of melting can be obtained as though two rows were used. In an endless number of cases we have found that general economy results through using but one row of tuyeres, and very nearly all the foundries which the writer has visited are now running that way. The coke used in the following tests was from the Solvay by-product ovens at Milwaukee, Wis.:

Fuel Ratios with By-Product Coke.

Test No. 1.

Inside cupola diameter at doors, 42 inches; at tuyeres, 40 inches; at melting zone, 41 inches.

Tuyere arrangement: 6 tuyeres, 10 x 4 inches, flaring from 6 x 4 inches. Lower side of tuyeres 14 inches above the sand bottom.

	Pounds coke.	Pounds iron.
Bed charge	1,000	3,000
Charges 2 to 11, inclusive	120	1,500
Charges 12 to 15, inclusive	100	1,500
Charge 16	80	1,000
Totals	2,680	25,000

Ratio of coke to iron, exclusive of bed, 1 to 13.1.
Ratio of coke to iron, inclusive of bed, 1 to 9.3.
Total time blast on, 2 hours and 5 minutes.
Pounds of iron melted per hour, 12,000.
Blast pressure varied from 9 to 10½ ounces.
Mixture used consisted of 45 per cent. unbroken pig and 55 per cent. medium weight scrap.

Castings for agricultural machinery and threshing engines were poured.

The iron was considerably hotter than needed.

Test No. 2.

The same cupola was used as in test No. 1.

	Pounds coke.	Pounds iron.
Bed charge	1,000	3,000
Charges 2 to 3, inclusive	150	2,000
Charges 4 to 11, inclusive	125	2,000
Charge 12	100	1,500
Totals	2,400	24.500

Ratio of coke to iron, exclusive of bed, 1 to 15.3.

Ratio of coke to iron, inclusive of bed, 1 to 10.2.

Total time blast on, 2 hours.

Pounds of iron melted per hour, 12,250.

Blast pressure varied from 9 to 10½ ounces.

Mixture used consisted of 45 per cent. unbroken pig and 55 per cent. medium weight scrap.

Castings for agricultural machinery and threshing engines were poured.

The iron was hot enough throughout the entire heat, and for pouring some of the work it was cooled by the molders.

Test No. 3.

Inside cupola diameter at doors, 37 inches; at tuyeres, 33 inches; at melting zone, 36 inches.

Tuyere arrangement: 4 lower tuyeres, 12 x 3 inches, flaring from 6 x 3 inches. Four upper tuyeres, 6 x 1¾ inches. Lower side of lower tuyeres 11 inches above the sand bottom. Top of the upper tuyeres 23 inches above the sand bottom.

	Pounds coke.	Pounds iron.
Bed charge	600	1,100
Charges 2 to 8, inclusive	90	1,100
Charge 9	50	700
Totals	1,280	9,500

Ratio of coke to iron, exclusive of bed, 1 to 12.3.

Ratio of coke to iron, inclusive of bed, 1 to 7.4.

Total time blast on, 1 hour and 10 minutes.

Pounds of iron melted per hour, 8140.

Blast pressure was started with 10 ounces, but was reduced, as the molders could not carry away the iron fast enough.

Mixture used consisted of 45 per cent. unbroken pig and 55 per cent. medium weight scrap.

Light sewing machine castings were poured.

The iron was very hot.

The coke dropped in the bottom from this heat was picked out and found to weigh 240 pounds. If this amount be subtracted from the coke used in the heat the net ratio of coke to iron, inclusive of bed, would be 1 to 9.1.

Test No. 4.

Inside cupola diameter at doors, 44 inches; at tuyeres, 41 inches; at melting zone, 42 inches.

Tuyere arrangement: 5 tuyeres, 8½ x 5 inches.

	Pounds coke.	Pounds iron.
Bed charge	1,005	4,000
Charges 2 to 5, inclusive	240	2,800
Charge 6	240	2,300
Charge 7	85	1,000
Totals	2,390	18,500

Ratio of coke to iron, exclusive of bed, 1 to 11.3.

Ratio of coke to iron, inclusive of bed, 1 to 8.1.

Total time blast on, 1 hour and 50 minutes.

Pounds of iron melted per hour, 10,090.

Blast pressure used, 7 to 8 ounces.

Mixture consisted of 70 per cent. unbroken pig, with 30 per cent. of quite heavy scrap.

Machinery castings were poured.

The iron was hotter than needed and was cooled down throughout the heat by throwing scrap into the ladles.

Test No. 5.

Inside cupola diameter at doors, 34 inches; at tuyeres, 32 inches; at melting zone, 32 inches.

Tuyere arrangement: 6 tuyeres, 7½ x 2½. Lower side of tuyeres 10 inches above sand bottom.

	Pounds coke.	Pounds iron.
Bed charge	610	1,800
Charge 2	160	1,800
Charges 3 to 6	160	1,800
Charge 7	105	1,600
Charge 8	35	500
Totals	1,550	12,900

160 pounds of old coke dropped in the bottom from the heat the night before was used during above heat, the amount being distributed throughout the charges. This gave 1390 pounds of new coke used during the heat.

Ratio of new coke to iron, exclusive of bed, 1 to 14.2.

Ratio of new coke to iron, inclusive of bed, 1 to 9.3.

Ratio of total coke to iron, inclusive of bed, 1 to 8.3.

Total time blast on, 1 hour and 8 minutes.

Pounds of iron melted per hour, 8795.

40 per cent. scrap and 60 per cent. of broken pig were used.

Very small agricultural castings were poured.

The iron was very hot.

Test No. 6.

Inside cupola diameter at doors, 30 inches; at tuyeres, 33 inches; at melting zone, 31 inches.

Tuyere arrangement: 4 tuyeres, 10 x 2½ inches, flaring from 6 x 4½ inches. Lower side of tuyeres 15 inches above sand bottom.

	Pounds coke.	Pounds iron.
Bed charge	550	1,100
Charges 2 to 7, inclusive	90	1,100
Charges 8 to 9*, inclusive	80	1,100
Totals	1,250	9,900

Ratio of coke to iron, exclusive of bed, 1 to 14.1.

Ratio of coke to iron, inclusive of bed, 1 to 7.9.

Total time blast on, 1 hour and 30 minutes.

Pounds of iron melted per hour, 6600.

Blast pressure not determined.

Mixture consisted of 75 per cent. broken pig and 25 per cent. scrap.

Castings for furnaces, requiring hot iron, were poured.

Iron was hot.

Test No. 7.

Inside cupola diameter at doors, 36 inches; at tuyeres, 38 inches; at melting zone, 39 inches.

Tuyere arrangement: 6 tuyeres, 16 x 3½ inches, flaring from 8 x 4½ inches. The lower side of tuyeres 14 inches above sand bottom.

	Pounds coke.	Pounds iron.
Bed charge	850	3,000
Charge 2	165	2,000
Charge 3	150	2,000
Charges 4 to 5, inclusive	125	2,000
Charge 6	75	1,500
Totals	1,490	12,500

Ratio of coke to iron, exclusive of bed, 1 to 14.8.

Ratio of coke to iron, inclusive of bed, 1 to 8.4.

Total time blast on, 1 hour.

Pounds of iron melted per hour, 12,500.

Blast pressure, 10½ ounces.

Mixture used, 50 per cent. pig, 50 per cent. light scrap.

Castings for railroad and jobbing work poured.

Iron was hot.

No records in any way are claimed for these heats, the figures simply being presented as of interest to foundrymen, showing what is actually being done under regular working conditions. These tests themselves show such a wide variation that that fact in itself is of interest in making comparisons, particularly as the quality of the coke used was very uniform. In many cases that have come under the writer's notice similar cupolas in both size and type would give widely different results even when the same coke was used. These variations were due to a variety of more or less understood causes, which it is not the purpose of this present paper to discuss, but when comparing the records here given with his own practice each foundryman must bear in mind that conditions vary.

The Mechanical Transport of Air.—The essential difference between the transportation of a solid and that of a fluid lies in the fact that while as a rule the former must be carried, the latter merely flows—as its very name indicates. Such flow is obviously toward the point of least resistance. In nature areas of high and low density create such pressure differences as to induce air movement upon a stupendous scale. But in the process of artificial movement through prepared conduits, as in systems of ventilation, the distances are usually small and the pressure is slight. In fan practice such pressure seldom exceeds 1 ounce per square inch where large volumes are to be kept in motion, and distances are measured in hundreds rather than in thousands of feet. The science of air transportation presents many puzzling problems, in the solution of which experience bears a large part. Much help has been given by the publications of blower manufacturers, prominent among which is the B. F. Sturtevant Company, Boston, which has for years published in its extensive series of catalogues many tables and much information relating to the subject. Its treatise on "Mechanical Draft" (a volume of 400 pages, for which a merely nominal charge is made) is particularly noticeable for its comprehensive treatment.

* Coke on last charge could have been reduced, but it was first thought that more than 1100 pounds of iron was to be put on the last charge; on the heat which was run the previous day only 105 pounds of coke were used on the last charge to melt 1600 pounds of iron.

American Foundrymen's Association.

The three days' session of the American Foundrymen's Association's annual convention in New York last week ended on June 8, the afternoon of the day being given to a trip to the Harrison, N. J., foundry of the International Steam Pump Company. The sessions of Tuesday, June 6, of which a report was given last week, and that on Thursday morning were held in the Grand Central Palace, Lexington avenue and Forty-third street. Wednesday's sessions were held at Columbia University.

Foundry Trade Schools.

One of the important questions discussed at the convention was that of better provision for the training of all around molders. The proposal for a foundry school came up in several forms, and a number of papers read before the Foundry Foremen's Section of the convention came back to the one point that the prime need in the foundries of to-day is better equipped molders and some incentive to bring bright young men into the foundry industry. What the Carnegie Technical School at Pittsburgh will do in foundry lines was outlined in a report presented by W. H. McFadden of Mackintosh, Hemphill & Co., Pittsburgh. This school expects to have ready for operation in the fall of 1905 a portion of its buildings, and one of the first to be erected will be that containing the foundry. A day course and a night course will be established. The former is for students in applied science who wish ultimately to specialize in some engineering branch or in foundry practice. They will have thorough instruction in the theory and practice of molding, the construction of the cupola and in chemistry relating to fuels and irons used in foundry mixtures. They will be made familiar also with foundry equipment. General instruction will be given such students in physics, chemistry, drawing, mathematics, cost systems and business organization. Only a limited number can be admitted to this course this year, and all applicants will be expected to pass an examination. The evening course in the foundry covers a greater number of years, but necessarily fewer hours to each session. It covers practically the same ground in technical branches, but the general studies are taken up in an elementary form. The night course is intended primarily for those already engaged in foundry work as molders or foundry helpers. A feature of the night course will be laboratory instruction in direct connection with the foundry. A series of lectures will be given on sand, iron, graphite, basic open hearth steel, brass, copper and other castings.

An ambitious programme for a foundry training school was outlined by H. M. Lane of Cleveland in his paper, "Making a Molder." Mr. Lane's scheme included the establishment of large works in foundry, machine shop, blacksmith and sheet metal working lines. The product of these works would go on the market and at the same time a large number of young men would receive practical training in the various trades represented. If afterward they took the technical courses they would enter technical schools deficient in foreign languages, but would receive credit for shop work, which would compensate for this deficiency. The course proposed by Mr. Lane is four years. For those who wished to become foremen and managers a fifth year is proposed, in which a course will be given in shop management, shop system, &c. For the establishment of such a training plant a very heavy investment would be required.

Still another scheme was presented in a paper on "A Practical Foundry School," by W. C. Bruce of the Bowler Foundry Company, Cleveland. The paper was read by title. Mr. Bruce proposed that a foundry in an Ohio town of 5000 inhabitants be secured, for which $50,000 in stock in a $100,000 company be paid. The remaining $50,000 was to be subscribed for by foundrymen and used to put the plant on a practical paying basis. Every foundryman stockholder would have a right to send such boys as he saw fit to the school, up to the capacity of the plant and in rotation. Each foundryman would have the right to have these apprentices educated on his own patterns. Mr. Bruce agreed in his paper to market the product of the foundry and stated that he had quite a number of shares already subscribed.

No action was taken on the matter, though the Committee on Foundry School is understood to be continued for another year.

WEDNESDAY FORENOON.

The large chemistry lecture room in Havemeyer Hall at Columbia University was quite comfortably filled Wednesday morning, and the convention was welcomed to Columbia by Secretary Moldenke, who is an alumnus of the university. He spoke for the faculty of the university, nearly all of whom had gone away for work with their summer classes. President Wolff called for a further discussion on the paper presented the preceding day by H. E. Field of Pittsburgh detailing the tests with fan and pressure blowers made by the committee of the Pittsburgh Foundrymen's Association.

Fan Blowers vs. Pressure Blowers.

F. W. Stickle of the Manufacturers' Foundry Company, Waterbury, Conn., asked as to the method used in operating the cupola in which the tests were made—whether the charges were of uniform weight from start to finish, whether the cupola was slagged, at what time the slag was started and what flux was used. All these points, he said, have a direct bearing on the horse-power required to melt a given amount of iron. A cupola kept in perfect working order will increase in its output as the melt progresses, instead of decreasing, as shown by the Pittsburgh test. In the test with the No. 10 fan blower the tuyere area was too small for the volume of air furnished, or the coke was too soft, which caused the cupola to bridge to a certain extent, and this is possible with either the fan or the pressure blower. The speaker had found that the volume of air must be determined by the stability of the coke used as well as the area of the cupola. The construction of the pressure blower is such as under ordinary foundry conditions would permit the escape of air through the float in much larger volume than would be forced into the cupola when in a semi-bridged condition. As shown by the tables in the paper, the greater the extent of the bridge the less the melting area left, for the figures indicate that the amount of iron melted per hour by the fan blower was only about half what it would have been under proper conditions.

H. E. Field said in reply to the discussion and to questions asked: The cupola was charged uniformly throughout, one-half scrap and one-half pig, and 4000 charges were used. The cupola was slagged, the slag hole being opened about three-quarters of an hour after the wind was put on. Limestone was used as a flux. A good quality of 72-hour coke was used, and a ratio of 1 to 8 was maintained. The tuyere area was an average of good foundry practice and was kept constant for all the tests. The two tests of the Connellsville blower demonstrate that too much air can be forced into the cupola for economical melting. The suggestion of Mr. Stickle that the tuyere areas were not large enough when the No. 10 fan was used is hardly warranted. An increase in area would have meant an increase in the amount of air forced into the cupola, and thus an increase in the bridge, as Mr. Stickle states. It must be kept in mind that this test was made to determine the horse-power required to run the fan and blower, and that all the conditions were submitted to and approved by the fan and blower makers before the tests were made. The report is simply a statement of conditions and results and not a criticism either of the fan or the pressure blower.

David Spence spoke of fuel as an important element in cupola economy. In one instance he had saved 20 per cent. in fuel costs by substituting Southern coke for what had previously been used. As to the matter of pressure, he had found that 12 to 12½ ounces would give just as rapid melting as 16 ounces.

Standards for Foundry and Pattern Shop.

W. H. Parry of Brooklyn, in a paper on "Foundry and Pattern Shop Standards," referred to the long standing dis-

agreement between molder and pattern maker as to the means each should employ to facilitate the work of the other. His paper was a plea for the standardizing of foundry and pattern shop practices for the benefit of the two departments. In loam work, the principle differences of opinion were as to the proper angle of the sides of inside and outside seats, their depth and the diameter of spindles used. In respect to the depth of core and outside seat, the ratios differed from 1 inch in depth of seat for a foot in hight of casting, regardless of diameter, to ½ inch of depth for a foot of hight. The writer took up other matters of difference, including the question of draft, the angle of the sides of core prints, and the size of molding machine flasks. An agreement on symbols was also advocated as saving time in writing orders for castings. In conclusion, Mr. Parry suggested that a committee be appointed to study the standardizing of pattern shop and foundry practices and make recommendations from time to time.

In the discussion on the paper H. M. Lane seconded Mr. Parry's suggestion, saying that companies making a specialty of flasks might well have a set of standard sizes for molding machine flasks, also a set of standard sizes for snap flasks and solid flasks for gated patterns. A resolution presented by Secretary Moldenke, that a committee be appointed to study the standardizing of pattern shop and foundry practices, was carried without dissent; but there was considerable discussion on a further motion for a committee to study standard foundry flasks.

Mr. Fuller said that he did not care for standard flasks for any job, but rather wanted everything to fit the job. That the pattern maker and molder should get together he agreed. The vital question was not only to have the dimensions of the flasks suit the outline of the pattern, but also to suit special gating. He believed in saving sand wherever possible and would therefore have the flasks a snug fit for the pattern. In the case of a job where 100,000 molds were made, the difference in sand as between a flask just fitting the pattern and one giving leeway was considerable.

In further discussion there were those who considered it poor economy to use too small a flask, arguing that it was better to use a little more sand than to run the risk of run outs. One speaker considered it a very common failing to crowd a pattern in a flask.

It was conceded by those who advocated standardizing that everything could not be brought to standard sizes. Jobbing foundry flasks, of course, could not be standardized, but it was argued that molding machine flasks at least could be, and that in general the effort should be made to abolish fractions and give flasks with dimensions in even inches. The motion for the committee was carried with but little dissent.

H. M. Lane of Cleveland presented his paper on "Storage of Patterns," giving some details of the systems in use in various establishments.

A Thermite Demonstration.

W. M. Carr gave a demonstration of several uses of thermite, together with an explanation of its composition and use. He showed that in some combinations the heat generated by the burning of thermite reaches 5400 degrees F. One of the tests made was for the production of steel by the use of thermite. In another case a stream of liquid thermite metal was allowed to fall upon a piece of 1-inch boiler plate. In a very few seconds the thermite had penetrated the plate. To show how the heat was localized, the operator handled the plate immediately after the steel passed through it. In another instance the thermite was employed for the welding of two pieces of wrought tubing, which had been butted and were held together by clamps. The operation consisted in casting around the two pieces at their point of contact the superheated steel in a manner somewhat like the method of "burning," as followed in the repairing of castings. Mr. Carr stated that in many cases repairs can be successfully made on iron castings by the thermite process. He referred to the use of thermite as a means of purifying cast iron and increasing its density; also for reviving the temperature of dull molten iron. In such cases the thermite is put into a can in the bottom of which has been placed ½ ounce of ignition powder; the whole is then attached to a rod and plunged below the surface of the dull metal. The possibilities of thermite introduced into large feeding risers were mentioned. A final use to which reference was made was in the possibility of introducing nickel into molten cast iron. It was stated that cast iron parts subjected to the influence of chemicals will give longer life when containing nickel, will also show less tendency to rust, even from atmospheric conditions, and will be improved in strength, density and fineness of grain. It was stated that nickel thermite is now being used successfully in Germany in connection with the manufacture of alkali pots, the amount of nickel thus introduced into cast iron being about one-half of 1 per cent.

H. E. Diller read a brief paper by G. N. Prentiss of Milwaukee on the "Repair of Driving Wheels by Thermite." It showed that the metal from a weld on a driving wheel gave the following analysis: Carbon, 0.12; phosphorus, 0.069; manganese, 0.74; sulphur, 0.029; silicon, 0.86. The tensile strength per square inch was 93,900 pounds.

James F. Webb of Elkart, Ind., presented a paper on the "Use of Thermite in the Railroad Shop." The method of repairing a break in an engine frame was explained in some detail. Mr. Webb stated that in the old way it cost from $225 to $300 to repair such a break, and that the engine was out of service about ten days. The cost of a thermite weld in one instance recently was $38, and the work required 48 hours. The engine was out of service four days.

WEDNESDAY AFTERNOON.

The foundrymen and their guests were entertained at luncheon Wednesday noon at the University Commons by the foundry supplymen in attendance at the convention. After lunch the members of the convention and others were grouped on the steps of one of the university buildings and a photograph was taken.

Variations in Alloys.

The Wednesday afternoon session opened with a paper by P. Longmuir, Sheffield, England, on "Variations in the Properties of Alloys." The paper was contributed by the *Metal Industry* and was read by Dr. Scholl, the editor. It was illustrated by lantern slides. These consisted chiefly of tables of the strength of alloys melted at various temperatures and of photo-micrographs of polished specimens of the alloys. Those cast at high temperatures generally showed a loose crystallization. Those cast at fair temperatures showed an interlaced and closer structure. In the case of the alloys cast at low temperatures the crystallization was sharp and angular and well defined. The principal alloys tested were of copper, tin and zinc, the percentages in one case being copper, 87.5; tin, 10.2; zinc, 1.8. The highest tensile strength was shown by the alloys cast at fair temperatures.

In connection with his paper on "Core Sands," J. S. Robeson of Camden, N. J., presented a series of lantern slides showing the appearance of various core sand mixtures under the microscope, variations being produced by the amount of loam coating the grains. The speaker gave examples of core sand mixtures that had been employed in various foundries. One mixture consisted of two parts of loam sand, one part of sharp sand, with flour as the binder in the proportion of 1 to 15. In other instances good results had been obtained by the use of gluetrin for a binder. The speaker referred to instances in which it had been substituted for flour, permitting of changes in the proportion of various varieties of sand used. In the discussion on the paper Messrs. Stickle and Parry referred to a claim recently made that certain core compounds permitted of the manufacture of jacket cores without vents for use in engine cylinder molds. Both agreed that this was not possible.

Better Pattern Shop Conditions.

The final paper of the afternoon was that of J. L. Gard of Denver, Col., on "Better Conditions in the Pattern Shop—an Experiment that Succeeded." In the absence of the writer it was presented by H. M. Lane. Mr. Gard detailed the results of an innovation introduced in his pattern shop about a year ago. He proposed to his employees to reduce the working day from nine hours to eight hours, with no decrease in pay. The employees in

return were to be responsible for perfect work and were to correct at their own expense all errors that were plainly chargeable to them. They were to attempt also to do as much work in eight hours as had been done in nine hours before. The writer said, while he did not expect to get nine hours' work in eight hours, he wanted to come as near as possible to the same result, expecting that in view of more care being necessary on the part of employees to prevent errors there would be some gain in time previously taken to do work over. He had impressed on his men that it was easier, as well as cheaper, to ask questions than to do the job over again, the idea being to give every help to the employee to get the work right the first time. With all the care taken in working out the new plan some differences had arisen, but there had been a spirit of give and take for the most part. Some men who had thought it pleasant to get the shorter hours would not play fair, and these were given the alternative of working nine hours at the same pay or quitting the job. The writer affirmed that a year's trial of the plan had shown it to be a success. The men were more careful and more to be depended upon. A great advantage was the gain in the feeling of responsibility. The percentage of errors had decreased very noticeably. While a record of the saving of dollars had not been kept, it was certain there was economy in the plan. Even if he had gained but one thing, freedom from the worry and expense of paying twice for a correct job, which often takes all the profit out of the work, he would consider it a success.

In the general discussion that followed Mr. Lane suggested that there was a chance for an excellent paper on the proper layout of a foundry and pattern shop establishment in the matter of storage room, yard room and operating room. Few plants exist in which there is a proper proportion of these various elements in the layout; but as new plants are being built, it is possible to approach more closely to what good working conditions demanded in the relations of these component parts.

THURSDAY FORENOON.

The final session of the convention was held at the Grand Central Palace, opening at 10.30 Thursday morning, with rather more members in attendance than is usual on the last day. The paper on "Foundry Costs," by Ellsworth M. Taylor, read at the Tuesday morning session, was taken up for discussion. August William of Philadelphia asked for more information as to the scale and kinds of foundry work in which it was possible to make a cost system pay. He considered there were cases in which the expense of clerical force and stationery necessary to keep close track of costs would be more than the saving from such a system. He wanted to know whether in all cases the money would come back.

Mr. Taylor, replying to this and other questions asked, considered that it was best for bench work to put it on a piece work basis and then establish a rate for the group of small castings that come in a single flask. In some cases it was not practical to identify in figuring costs the small lapses of time connected with operations on particular castings. The broad question for a foundryman to determine is, whether he will ascertain his costs by observation or by exact methods. When once the first cost is computed he has it for all time, it is true, but it is the leakages and fluctuations that introduce the variables which must be watched. The speaker granted that there were foundries where the work is so small that if an attempt were made to get in detail the cost every day the foundry would be swamped by the outlay. The object of cost keeping work is to help the foundryman to make money. How much he should enter into detail the manager must determine by the character of his work. No hard and fast rule could be laid down.

Standardizing Analysis Methods.

H. E. Diller, secretary of the metallurgical section of the association, made a report for the past year. The principal work undertaken was in the standardizing of methods of analyzing cast iron. The committee has agreed on the method for determining silicon and had almost ready a method for determining total carbon. The committee's method for the determination of silicon in pig iron and cast iron as follows:

"Weigh 1 gram of sample, add 30 c. cm. nitric acid (1.13 specific gravity); then 5 c. c m. sulphuric acid (conc.). Evaporate on hot plate until all fumes are driven off. Take up in water and boil until all ferrous sulphate is dissolved. Filter on an ashless filter, with or without suction pump, using a cone. Wash once with hot water, once with hydrochloric acid, and three or four times with hot water. Ignite, weigh and evaporate with a few drops of sulphuric acid and 4 or 5 c. cm. of hydrofluoric acid. Ignite slowly and weigh. Multiply the difference in weight by 0.4702."

The committee presented this method as one that sacrificed shortness to insure accuracy, and that left little to the judgment of the chemist. While it was recognized that it is almost impossible to get chemists to use a standard method in their daily work, the one proposed would serve as a check method in case of dispute between laboratories or between buyer and seller.

Decrease in Annual Dues.

Secretary Moldenke suggested that perhaps the membership of the association might be increased by lowering the annual dues. A good many foundrymen seem unwilling to spend $10 to secure the benefits of membership. It was finally decided, after some discussion, to reduce the dues to $5 per year and make a strong effort to increase the membership.

Election of Officers.

W. A. Jones of the W. A. Jones Foundry & Machine Company, Chicago, reporting as chairman of the Nominating Committee, presented the list of officers given below. Mr. Jones stated that in view of the probability that the convention of 1906 would be held in Cleveland, it had been thought well to select for president a representative of the Cleveland district. The committee therefore proposed the name of Thomas D. West as one who had made a large contribution to the advancement of foundry practice and had done much to further the interests of the association. The secretary, on motion, was instructed to cast the ballot for the following persons for the various offices:

President, Thos. D. West, T. D. West Foundry Company, Sharpsville, Pa.

Vice-Presidents:

New England States.—H. A. Carpenter, A. Carpenter & Sons, Providence, R. I.

New York and New Jersey.—H. Van Atta, J. L. Mott Iron Works, New York.

Pennsylvania, Delaware, Maryland and District of Columbia.—A. W. Slocum, National Car Wheel Company, Pittsburgh.

Michigan, Ohio, Kentucky and Tennessee.—A. K. Beckwith, P. D. Beckwith Estate, Dowagiac, Mich.

Indiana, Illinois, Missouri, Kansas, Colorado, New Mexico, Utah, Arizona, Nevada and California.—David Spence, Greenlee Foundry Company, Chicago.

Wisconsin, Minnesota, Iowa, North Dakota, South Dakota; Idaho, Nebraska, Montana, Wyoming, Washington and Oregon.—Adam Bair, foundry superintendent, Chicago, Milwaukee & St. Paul Railroad, Milwaukee, Wis.

Southern States.—J. P. Golden, Golden's Foundry & Machine Company, Columbus, Ga.

Canada.—T. J. Best, Warden, King & Co., Montreal, P. Q.

Secretary and treasurer, Richard Moldenke, Watchung, N. J.

W. A. Jones and C. H. Thomas were appointed to escort Mr. West to the chair, and the president-elect was warmly greeted. He referred in strong approval to the work of Secretary Moldenke, who, he said, had been the "binder" holding the membership together. With all the good done thus far by the association he believed there was much more to do, and he predicted that the convention of 1906 in Cleveland would be a pronounced success.

A vote of thanks was given to the retiring officers, and ex-President Wolff was elected an honorary member of the association. A vote of thanks was also given to Columbia University, to the writers of convention papers

and to those who had assisted in the entertainment of the convention.

A formal invitation was presented from Mayor Johnson and the directors of the Cleveland Chamber of Commerce for the holding of the convention of 1906 in that city. A number of Cleveland foundrymen joined in the invitation. It will be acted on later by the Executive Committee. It was stated by the secretary that Philadelphia foundrymen wanted the convention of 1907, and Lawrence Lee Anthes of the Toronto Foundry Company, Limited, said he had little doubt the foundrymen there would be glad to have the convention in the following year.

On the recommendation of the Nominating Committee the following section officers were confirmed. The Pattern Makers' Section is a new one, the organization having been effected at the present convention:

Foundry Foremen's Section.—David Reid, Canadian Westinghouse Company, Limited, Hamilton, Ont., chairman; F. C. Everitt, J. L. Mott Iron Works, New York, secretary.

Metallurgical Section.—R. S. McPherran, J. I. Case Threshing Machine Company, Racine, Wis., chairman; H. E. Diller, Western Electric Company, Chicago, secretary.

Pattern Makers' Section.—J. H. McCaslin, Wellman-Seaver-Morgan Company, Cleveland, chairman; Wm. H. Parry, National Meter Company, Brooklyn, secretary.

Visit to Harrison, N. J.

A large number of the foundrymen went in a party to Harrison, N. J., on Thursday afternoon to visit the new and elaborately equipped foundry of the International Steam Pump Company. A wide range of castings is produced at this plant, both in cast iron and brass. The products of the iron foundry vary in weight from a few ounces to many tons, some of the huge frames of water works pumping engines being 60 feet in hight and requiring 30-ton cranes, company locomotives and flat cars for handling. A feature of the visit was the pouring of a 1000-pound casting after nickel thermite had been introduced into the ladle. About 1 per cent., or 10 pounds, of nickel thermite was used, this being poured from a small ladle into the ladle containing the cupola iron, when the latter was about half filled. Then the remaining iron was tapped out, and, lastly, there was added to the ladle of molten iron one-sixteenth of 1 per cent. of a mixture of titanic oxide, aluminum and iron oxide, this being designed to cleanse the iron, particularly to remove nitrides, and thus increase the density of the iron. The pump casting, which was poured after the titanium thermite had been thoroughly stirred into the metal, will be tested, to ascertain what increase of strength as well as resistance to corrosion was given by the nickel and titanium additions.

Notes.

J. J. Burgen of the Lane Mfg. Company, manufacturer of wood working machinery, Montpelier, Vt., has attended every convention of the American Foundrymen's Association since its organization at Philadelphia in 1896. The intervening conventions have been held in the following cities: 1897, Detroit; 1898, Cincinnati; 1899, Pittsburgh; 1900, Chicago; 1901, Buffalo; 1902, Boston; 1903, Milwaukee; 1904, Indianapolis.

Several exhibits of foundry equipment and supplies were inspected by the visitors in the corridors of the Murray Hill Hotel. Thomas W. Pangborn Company of New York showed the products of several companies for which it is Eastern agent, these including the Hanna Engineering Works and the Brown Specialty Machinery Company of Chicago and the National Corundum Wheel Company. The Hanna shaker for sifting sand was shown in operation. A feature of the exhibit was the Hammer core machine for the manufacture of stock cores from ⅜ to 2¼ inches diameter. There was also shown for the first time, by William N. Gartside, proprietor of the Diamond Clamp & Flask Company, Richmond, Ind., a core machine designed for the manufacture of odd shaped cores. It is a universal machine, working the core either vertically or horizontally, making cores of any length in the horizontal position, and short and irregular cores with cone prints in the vertical position. An attachment of this machine is a special core lifter, by which cores 12 to 14 inches long can be piled as easily as short ones. The cores as made are received on the core lifter and piled on the core plate ready to be transferred to the core oven. The Wadsworth core machine, as exhibited by the Falls Rivet & Machine Company, Cuyahoga Falls, Ohio, was shown turning out 6-inch cores.

Mrs. Clark Fisher, who as one of the proprietors of the Eagle Anvil Works, Trenton, N. J., has the management of a foundry, was an interested attendant upon the sessions of the convention.

The enrollment of members and guests ran up on the last day of the convention to about 250, making the attendance at the New York convention larger than that at Indianapolis last year or at Milwaukee in 1903.

A number of the foundrymen were accompanied by ladies, and while there was no local Entertainment Committee, parties were organized and the ladies were taken to various points of interest in and about New York.

The Molders' Patterns Tariff Case.

WASHINGTON, D. C., June 13, 1905.—The Treasury Department is about to promulgate a decision of the United States Circuit Court with regard to the proper classification of certain patterns for machinery from which it is probable that the Government will take an appeal. The issue is one of considerable importance, and as the decision against the Government is stated by the court to have been reached by resolving a question of doubt in favor of the importer it is believed by the Department officials that the presentation of additional evidence will result in a reversal of the judgment by the Court of Appeals.

The importation over which this controversy has arisen consisted of molders' patterns intended to be used in the manufacture of castings for printing presses. They were imported at New York by the firm of R. Hoe & Co. and were assessed for duty as manufactures of wood, but were claimed to be free under that provision of the Dingley tariff act which grants free entry to "patterns for machinery." The Board of General Appraisers sustained the assessment of duty after taking a large amount of testimony. An appeal was thereupon taken by the importer to the United States Circuit Court, which has reversed the board in a brief but comprehensive decision, in which the following statement is made:

> There is much force in the contention of counsel for the Government, and the question is one as to which I feel great doubt. I feel it to be my duty to resolve said doubt in favor of the importer, and I therefore conclude that, as no commercial designation has been shown which confines the word "patterns" to any particular class, and as the ordinary use of patterns is for making parts of machinery in the way these patterns are used, and as it appears from the testimony that model patterns are more strictly patterns of machinery rather than patterns for machinery, these articles are patterns for machinery and cannot be fitted for use otherwise. The decision of the Board of General Appraisers is therefore reversed.

The contention upon which the Government will probably appeal this case is the claim that the provision of the free list quoted by the court was intended solely to embrace models or patterns which cannot be used for the molding of castings and which have no practical utility other than to illustrate the ideas of the inventor.

W. L. C.

The Republic Iron & Steel Company's Good Work.—The production of billets at this company's Bessemer steel plant for the week ending May 27, 1905, was as follows:

	Gross tons.
Sunday	799
Monday	1,627
Tuesday	1,745
Wednesday	1,787
Thursday	1,724
Friday	854
Total	10,304

The Northern group of blast furnaces made the following product in the same week:

	Gross tons.
Atlantic	2,067
Haselton	2,056
Hannah	1,814
Hall	877
Total	6,814

Cleveland Cap Screws Win the John Scott Prize.

The Franklin Institute, Philadelphia, has awarded the Cleveland Cap Screw Company, Cleveland, Ohio, the John Scott legacy premium and medal for the superiority of its product. The company's method is that of electrically welding the heads to the bodies. An excerpt from the concluding remarks of the committee reads as follows:

It is well understood that, in screws milled from solid stock, threads are cut on a body which is softer and weaker than the original outer surface, and while great economy in metal and a possible reduction in total cost are brought about by electrically welding heads to bodies, the die drawn stock itself is of much greater strength. In reference to the cap screws made with United States standard or Franklin Institute heads we believe this to be an important item practically, as the small bearing shoulder under an ordinary cap screw head, which actually becomes less proportionately as the size of the screw increases, is very often crushed or burred in use, and the unhandy size of the head of the ordinary cap screw, especially when used in connection with a solid or drop forged wrench, is a matter that all machinists and engineers have met with. There never was, we believe, any valid reason other than economy of stock and labor of removal of metal for making these heads so small, though probably before the application of electrical welding the cost would have been prohibitive. An electrically welded head and body when made of die drawn stock is apparently a great gain in both economy and strength. In view of the points already mentioned and the efforts the Cleveland Cap Screw Company has made in the manufacture and introduction of an improved product for use of machine builders, in the strength, handiness, finish, &c., the committee would recommend the award of the John Scott legacy premium and medal.

While the bolts and screws that enter into the construction of a machine may seem to be an item of lesser consequence, it is undoubtedly very important that the best and most accurate screws be used. United States standard head cap screws retain the sharp corners of the heads if they are used with solid wrenches, which generally go with a machine. These come in nut sizes, hence there is no difficulty in securing the proper wrenches. The fact that the nuts, both finished and semifinished, and the cap screw heads are of uniform size is another important feature which adds to the uniformity of the appearance of the whole.

The Chicago Pneumatic Tool Company.

J. W. Duntley, president of the Chicago Pneumatic Tool Company, Chicago, returned June 5 from Europe, where he had spent six weeks in the interest of the company. He brought with him orders for 3400 tools for shipment from America, representing a value of over $300,000.

Mr. Duntley states that the trip was the most successful he has ever experienced, and owing to the growing demand for pneumatic tools in England and on the Continent it has been found necessary to extend the organization of the foreign business. In order to accomplish this the factory and business of E. G. Eckstein, Berlin, Germany, and that of the Lencke Company, St. Petersburgh, Russia, were purchased and will be operated for the purpose of meeting these requirements in Continental countries. Pneumatic tools are rapidly being introduced in shipbuilding and other large industries in Russia, Austria, Germany, Italy, France, &c. The line of electric drills exhibited and demonstrated was extremely successful and large orders were received therefor. Owing to the fact that all European countries are well equipped with electricity the electric drill is destined to rival the air drill in time, and opens up a field which heretofore could not be solicited. The profits earned through the extension of the foreign business will accrue to the benefit of the Chicago company.

The English courts on May 17 rendered the final adjudication of the patent litigation instituted by the English company, which decision sustained all of the company's claims, 52 in number, covering pneumatic hammers, thus leaving the English company in a particularly strong position with reference to its patents. Its plant at Fraserburgh, Scotland, is now in full operation. The American business, according to President Duntley, shows a very satisfactory increase in volume. All factories, both American and foreign, are operating overtime. The month of May was the largest month in the history of the company.

The Roe Mechanical Puddling Process.

BY JOSEPH HARTSHORNE, POTTSTOWN, PA.

The process invented by James P. Roe was developed by him at the plant of the Glasgow Iron Company, Pottstown, Pa. It was described at a rather early stage of its development in a paper read before the American Institute of Mining Engineers in Philadelphia in May, 1902. Since then the furnace has been remodeled by making an essential change in the shape of the bottom, and several improvements have been made in the squeezer. The inventor set before himself three problems, the complete solution of which he deemed necessary to technical and commercial success with a mechanical puddling process. These were:

1. The designing of a mechanical puddler which would be simple in construction and operation; rapid, effective and controllable in manipulation; economical in fuel and repairs, and which would carry out completely the three steps of puddling, balling and drawing the heat; and the designing of a squeezer which would remove the cinder from large balls and deliver the squeezed mass in proper shape for the most economical further treatment.

2. The providing of a lining suitable to the necessary chemical reactions which would be sufficiently durable to be economical and would avoid those troubles which were among the principal causes of the failure of the rotary puddlers of the Danks type.

3. The organization of the process so that those economies and advantages might be gained which are due to the continuous and rapid handling of large units, both in conversion and finishing, as is now done in the manufacture of steel—*i. e.*, the putting of the manufacture of iron upon the same plane as that of steel.

It is believed that a practical demonstration of the successful solution of these problems has been made in the plant at Pottstown.

The Furnace.

The furnace consists of a box which is practically rectangular in cross section and nearly three times as long as it is wide, the present furnace being about 20 feet long. It is supported by hollow trunnions in the middle of the long dimension and is practically in balance, so that it can be oscillated through an arc of about 65 degrees on each side of the center with slight expenditure of power. The fuel is introduced through the two trunnions and the flames impinge on each other as they meet in the middle of the furnace, thus insuring a very perfect mixture and combustion and a uniform distribution to each end of the furnace. Short stacks are provided at each end for the egress of the products of combustion, which are controlled by dampers in the usual way. The furnace is oscillated by pinions, driven by an engine, gearing into circular racks which are bolted to extensions of the slide plates downward. The bottom is made up of a series of channels through which water is circulated, and parts of the door and side walls are also water cooled.

One end of the furnace consists of a door, opening the full cross section, while the other end is given a shape calculated to increase the mixing action of the oscillations and to more readily consolidate and turn the finished iron. The door is opened and closed by means of an hydraulic cylinder and is kept closed during operation by means of safety bolts, which are also operated by water. An opening is provided on one side, near the end opposite to the door, for charging the molten iron and cinder, with an observation door directly opposite to it. In the corresponding positions near the door are two openings for charging the scale, or other oxide, and which are also used for observation. Other peep holes are placed on each side of the two trunnions and two tap holes are provided in the rear end for draining off cinder, if desired.

The Squeezer.

The squeezer is operated by hydraulic power, which is applied to the ball in the two horizontal directions and in the vertical direction at the same time. The puddle ball is shot directly from the furnace into the squeezer and the pressure is applied at 600 pounds, the regular shop pressure. This can be raised to 1800 or 2500 pounds, as desired, by means of an intensifier. When released from the squeezer the puddle ball has been pressed into a rectangular bloom, as free from cinder as is desirable, in condition to be rolled into finished product, such as plates, &c.

The Lining.

The roof of the furnace is made of ordinary fire brick, and the sides are lined with the same down to a little above the slag line. The bottom is made of magnesite brick, which extends up the sides to meet the fire brick. The door and end are lined throughout with magnesite brick. Before the first heat of a campaign a comparatively thin layer of scrap cinder (cinder made by cutting down iron scrap in a reverberatory furnace) is flowed over the bottom. This cinder is very refractory and is little affected by the puddling operation, due to protection by the water cooled substructure. The additions of the same material, but in general the slag bottom may be repaired from time to time by further remaining in the furnace after the heat and that added before the heat are sufficient to keep it in good shape. This lining, unlike the fettling of the ordinary puddling furnace, is intended to be permanent in character and to have no active influence on the bath. It is strong, smooth and well bound together, and there is no danger of small pieces breaking off from it and becoming entangled in the puddle ball. This defect, which is inherent to the fettling of the rotary puddlers, was one of the principal causes of the failure of these furnaces in practice. The pieces of fettling were not removed by the squeezer and caused blisters or seams in the finished product. As a matter of fact, only the middle quarter, or third, of the bottom in the Roe puddler shows any signs of wear, and this is easily kept up as described.

The Process.

The furnace having been brought up to a heat and the scrap cinder bottom prepared, the first step in the process proper is the charging of a certain amount of molten cinder, which has been prepared in an auxiliary furnace. Generally about 18 per cent. is charged, but it is not primarily intended as the active puddling agent. It serves to seal the joints of the door, to present a medium for retaining the sulphur and phosphorus, to form a lubricant between the puddle ball and the bottom in the final stage of the operation, to act as a welding cinder in the squeezer and rolls, and, finally, to aid in preserving the bottom by building up on it. Puddle tap cylinder has been principally used for this purpose, but any oxide of iron, such as an ore, will answer which will melt to a cinder of about the same composition.

As soon as this cinder is charged the furnace is oscillated once or twice, so that it may wash into the joints and seal them shut and at the same time cover the bottom with a thin film of semiviscid cinder. Molten iron from the blast furnace, mixer or cupola is then charged and the furnace is started on regular oscillations. At this time the body of the furnace should be up to full heat, but the bath should not be too hot.

The oxidizing agent is then charged through the opening near the door by means of a long spoon, which distributes it evenly across the entire width of the furnace. Roll scale has proved to be the most convenient agent, although any high oxide of iron answers very well, provided it be low in silica. The additions are made between oscillations until sufficient has been added. Besides their oxidizing action these additions tend to keep the bath cool and to promote in this way the removal of sulphur and phosphorus, while retarding the removal of carbon. During this period the oscillations are comparatively rapid and at a high angle, so that the agitation is very great, and a very thorough and complete intermixing of the iron and cinder is obtained. Very soon the bath begins to boil, and the next stage of the operation is reached.

This stage is called the "high boil." It is characterized by the fact that no free iron can be seen sliding on the bottom, all being mixed with the cinder, and by the frothy condition of the bath. The boiling is much more violent than in the ordinary puddling furnace, and the bath swells to more than twice its original volume. The whole surface is covered with spurts of burning carbonic oxide. During the high boil the oscillations are slower and at a much lower angle. The natural agitation is sufficient for the greatest speed, and a higher rate or angle of oscillation would wash the roof and sides too much as well as spill the bath out through the openings. The grains of iron can be seen forming in the cinder soon after the boil begins, thoroughly disseminated throughout the bath. As the boil progresses the bath thickens up, the number of grains increases and the character of bubbles changes from a great number of small ones to a comparatively few large ones, from the middle of which spurt jets of burning gas.

The end of the high boil is marked by a sudden dropping of the bath. The wrought iron can now be seen scattered through the cinder in various sized, loosely cohering clusters and sliding on the bottom behind it. This is perhaps the most critical period as regards the quality of the finished product, and the oscillations must be so regulated as to bring forward the operation uniformly, so that no raw iron may be left when the heat is balled. This is accomplished by preventing the too rapid agglomeration of the iron and by keeping it spread over the bottom as much as possible. It is regulated by varying the speed and angle of the oscillations and by short rests at the ends and in the middle. By this means the iron is also kept uniformly exposed to the heat of the flame. In this way the other great defect of the rotary puddlers is avoided. There was no way in operating them by which the "making" could be retarded or regulated, and they almost always left some raw iron in the ball, which caused blisters and other defects in the finished product, besides making it very uneven in composition.

During this period the clusters of iron are to a great extent above the cinder, and during their passage through the hot center of the furnace acquire the heat necessary for thorough welding. Owing to the fact that about half of the bottom is always bare and exposed to the direct action of the flame it becomes very hot during this period, and keeps the under side of the iron at about the same temperature as the top. Little, if any, difference can be seen when a piece turns over.

The final stage of the process is the balling. When the puddler decides that the iron is all "made," or finished, the angle of oscillation is suddenly increased so that the whole mass slides down the bottom with sufficient momentum to consolidate itself against the ends. The door end is flat and at right angles with the bottom, but the other end is designed to turn the mass up and over so that all parts are exposed to the flame during this period. As soon as the balling is sufficiently complete, which generally takes but a few oscillations, the door is opened and the mass is shot directly out into the squeezer. The door is then closed and the cinder for the next heat is at once charged. It is very rarely that any work is required before the next heat can be proceeded with after discharging the ball.

The furnace has ample reserve of heat and responds readily to manipulation in this respet. The fuel at present used is oil, on account of its simplicity of application and manipulation, but producer or natural gas can be used if economical reasons suggest their use. The requirements as to temperature and quality of flame are practically the same as in the ordinary puddling process, and they are regulated in a similar manner.

When the ball has settled in the squeezer the front of the latter is drawn in and the mass is pressed against the back wall. The ends are then pressed in, and, finally, the vertical pressure is applied. All this is done with the ordinary shop pressure of 600 pounds. The pressure is then increased to 1800 pounds, or 2500 pounds, if desired, and applied until no further movement of the

plungers can be obtained. The present size of the finished bloom is 54 x 24 inches, varying in thickness with the weight of the ball, the average being 12 inches. All or nearly all of the cinder removed is taken out at the low pressure, and, while some cinder may be removed also, the principal function of the squeezer at the high pressure is that of a forging press, and the bloom leaves it in a relatively consolidated condition—much more so than that of the steel ingot.

As soon as the bloom leaves the squeezer it passes to the blooming mill to be rolled into slabs, billets or blooms. It can be rolled directly into plates or other finished products, but in that case it must be reheated between the squeezer and the mill.

It will be observed that during the whole of these manipulations there is but one period, that between the beginning of crystallization and the end of balling, when the metal is in a different condition from that in which it is during the manufacture of steel, or requires a different treatment. This period of crystallization, together with balling and squeezing, occupies the place of casting into molds in steel making, and is analogous to it in being the period of consolidation. It is to be noted, however, that when the bloom comes from the squeezer it is in a more advanced stage than is the steel as it comes from the mold in the form of a relatively spongy ingot. It has the further advantage that on account of there being no segregation or piping to be allowed for the ends are as solid as any other part, and no cropping is required until the final product is to be squared up.

The Results Attained.

The process has now been developed at Pottstown as far as seems possible with experimental and nonconsecutive running. The further changes and improvements that are necessary or attainable can only be reached by continuous running under commercial conditions and through the natural increase in skill and experience thereby obtained. It is not possible to operate a single machine with commercial success, since the general and fixed charges are too great to allow a profit to be obtained on the relatively small product.

The experimental work of development has, however, fully shown what can be done with the process. It has been demonstrated that masses of puddled iron can be produced at one heat which weigh 4000 pounds and measure 54 x 24 x 12 inches and which are physically and chemically homogeneous. The blooms as they come from the squeezer are as free from cinder as ordinary muck bar and the content of cinder is under control, within certain limits. The chemical composition is also under control and iron can be produced at will from the very softest, like the best Norway, through the ordinary grades, like skelp, up to the very hardest and strongest. There is no apparent reason why the so-called puddled steel should not be made by this process, although nothing above an ultimate strength of 68,000 pounds has been attempted as yet. The quality of the product has been thoroughly tested by analysis, physical tests and working into finished product.

The following table shows a few heats taken at random to illustrate the three grades of soft, skelp and strong iron:

The average time for making a heat since the furnace first started is 59 minutes. This time should be considerably reduced in a properly designed plant and with the natural increase in skill due to continuous running.

The cost of hand puddling in eastern Pennsylvania is approximately $11, based on the following prices:

	Per ton.
Pig iron (for loss)	$16.00
Ore	4.80
Labor (puddler's rate)	4.00
Coal	2.70
Scrap	14.00

A conservative estimate of the cost of billets made by the Roe process, under the same prices and in a properly designed plant, is $3.70 per ton. This estimate is based on the actual costs under experimental, nonconsecutive running in a badly balanced plant, applied to conservative estimates of the product to be obtained in a suitable Roe plant. These estimates have been very carefully made and have been subjected to severe scrutiny by several outside experts. It is believed that no serious error will be found in them. In the above estimate the use of a mixer is contemplated. An actual gain of 4 per cent. in the weight of the squeezed bloom over that of the pig iron charged has been demonstrated.

The saving in cost of the Roe billet over that of muck bar in hand puddling is therefore about $7.30. There is also the further advantage that the Roe billet is a solid mass ready for rolling, whereas the muck bar must be cut up and piled before it can be rolled into the finished product. The bloom as it comes from the squeezer is as well fitted for rolling to a finished product as is the billet and is better than the steel ingot.

The cutting and piling of the muck bar require a considerable expenditure of labor, and the manifold surfaces of the pieces composing the pile are all subjected to oxidation in heating, which increases the surface so exposed to not less than five times that of the slab or billet. This gives rise to a furnace loss of from 10 to 12 per cent. for the pile, as against from 3 to 6 per cent. for the steel or iron slab. A greater percentage of finished product can be obtained from the iron slab or billet, as from those of steel, than is possible from the irregularly shaped pile with its unequally distributed material.

The average results in these respects are about as follows, on grooved or universal mills:

	Per cent.
An iron pile containing 15 per cent. scrap and 85 per cent. muck bar will waste in heating	11
Scrap made in rolling the pile to skelp	11
Total	22
Slabs of solid wrought iron, such as produced by the Roe squeezer, will waste in heating	6
Scrap made in rolling the slab to skelp	3
Total	9
Steel sheared slabs will waste in heating	4
Scrap made in rolling the slab to skelp	3
Total	7

These various differences between rolling iron slabs and muck bar piles to the same finished product result in a saving for the former over the latter amounting to from $1.50 to $3, depending on the character of the finished product. Adding this to the $7.30 saved in pud-

Table I.

Pig iron. Analysis.			Weights.			Additions.		Final.	Finished products. Physical tests.			Analysis.		
P.	S.	Si.	Pig iron.	Bloom.	Gain.	Cinder.	Scale.	Cinder.	Ult.	Elon.	Red.	C.	P.	S.
Per ct.	Per ct.	Per ct.	Pounds.	Pounds.	Per ct.	Pounds.	Pounds.	SiO_2.	Pounds.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
0.63	0.03	1.40	3,360	3,480	3.45	900	650	11.76	45,890	30.0	44.4	0.07	0.066	0.009
0.61	0.03	0.70	3,410	3,535	3.53	850	680	14.60	51,370	23.7	44.1	0.05	0.141	0.011
0.60	0.03	0.60	3,510	3,690	4.70	1,000	670	15.14	52,300	27.0	41.2	0.06	0.157	0.012
0.63	0.03	1.40	3,400	3,540	3.95	1,075	2,100	11.56	44,000	24.7	32.7	0.05	0.063	0.011
0.61	0.04	0.81	3,420	3,545	3.52	950	570	15.68	44,700	16.2	19.6	0.07	0.126	0.012
0.60	0.03	0.87	3,570	3,490	3.44	1,000	846	18.00	48,900	20.0	28.0	0.05	0.237	0.020
0.61	0.03	1.10	3,350	3,630	7.70	1,100	720	19.84	41,230	12.5	16.5	0.05	0.257	0.017
0.62	0.03	0.65	3,400	3,520	3.41	825	660	17.96	48,700	23.7	31.3	0.06	0.225	0.017
0.60	0.03	0.45	3,270	3,550	7.88	1,200	480	13.10	49,160	16.2	34.9	0.08	0.210	0.010
0.63	0.02	1.10	3,470	3,695	5.82	1,520	660	19.00	65,500	17.7	28.9	0.10	0.221	0.015
0.61	0.06	0.80	2,790	2,830	1.41	800	420	17.30	60,800	17.7	24.4	0.15	0.142	0.015
0.62	0.03	0.62	3,520	3,840	8.33	1,100	660	16.60	62,220	21.2	42.7	0.18	0.176	0.012
0.61	0.05	0.50	2,870	2,885	0.52	600	620	17.80	60,850	15.5	27.6	0.10	0.111	0.021
0.60	0.03	0.95	3,440	3,480	1.15	1,300	780	14.40	69,000	18.2	34.9	0.14	0.152	0.009

dling, as shown above, there results a total saving on the finished product by the Roe process of from $8.80 to $10.30 per ton.

The Roe bloom has the further advantage over the muck bar pile that it is solid and homogeneous, both chemically and physically, whereby the laminations, streaks and blisters so frequently met with in piled iron are entirely avoided, as well as the troubles due to irregular composition.

The following analyses made on different plates from the same heat show in a general way the uniformity of the product:

Table II.

Heat No.	C.	P.	S.	S. in the pig iron.
155	0.06	0.073	0.008	
155	0.06	0.067	0.008	0.028
155	0.05	0.063	0.011	
155	0.07	0.066	0.009	
159	0.06	0.172	0.023	
159	0.06	0.165	0.017	0.07
159	0.05	0.168	0.018	
160	0.06	0.131	0.020	
160	0.10	0.111	0.021	
160	0.07	0.125	0.017	
161	0.10	0.141	0.015	0.055
161	0.07	0.155	0.018	
179	0.06	0.392	0.021	0.034
179	0.06	0.376	0.028	

While the squeezed bloom is comparable with the steel ingot, although really in a more advanced stage of manufacture, it has the advantage over it that it can be rolled directly into finished product with as much ease, with equal results as to quality and with as little scrap loss as is the case with the rolled bloom or slab. It is therefore not subject to the trouble and danger incurred when rolling the ingot direct, especially as regards surface defects, even if it be admitted that an equally good product can be obtained from the ingot as from the steel slab, an admission which is at least open to grave doubt. When the squeezed bloom is rolled into billets or slabs before finishing there is no necessity for cropping until the final product is reached, since the ends of the bloom are as solid and homogeneous as the rest of it.

The Use of Iron.

There were over 3,000,000 tons of finished wrought iron produced in this country in 1902 (the latest available statistics, such as they are), and about one-half of this was made from muck bar. This in itself would furnish a very respectable market for the Roe process in competition with hand puddling. There is also, however, a large field which is now occupied by steel simply because it is cheaper to the manufacturer. It is possible also that some influence in this direction is due to the acknowledged deterioration in the quality of wrought iron in late years under the severe struggle to cheapen its production. This field will surely be recovered by wrought iron when the best quality can be produced as cheaply as steel. It is believed that both of these conditions are attainable by the Roe process.

A few years ago the trend of opinion was toward the use of steel for all purposes, and it seemed generally to be believed that it would gradually exclude iron from all but very special uses. It has always been held by some authorities, however, that iron was the better material where shock or vibration was to be resisted or where welding was required, and also that iron resisted corrosion better than steel in itself and furnished a better bonding surface for the various protectives, such as tin, zinc, paint, &c. These opinions are unquestionably gaining ground to-day, and it is beginning to be realized that steel is not as well fitted as iron for many of the purposes to which it has been applied.

It has been gathered from many roofers and tinsmiths that painted or galvanized sheets made from wrought iron last from five to six times longer than those made from steel. In my own experience, iron sheets placed on a building 20 years ago (unpainted for 11 years) will still turn water on parts of it, while steel sheets placed on other parts under the same conditions have never lasted over four years. Under such conditions steel is by no means cheaper to the consumer than iron is, even at the lower first cost, and iron will be demanded as soon as the public realizes the situation, especially if iron can be furnished as cheaply as steel.

At the Washington meeting of the American Institute of Mining Engineers, held a few weeks ago, Dr. C. B. Dudley, chemist of the Pennsylvania Railroad Company, indorsed the statement that the time seemed to be ripe for a return to iron in some of the uses for which steel is now employed. As an instance of the reasons moving him in this direction he cited the fact that in railroad axles wrought iron of from 48,000 to 52,000 pounds per square inch tensile strength would stand a fiber stress in the middle of the axle which requires a steel of 80,000 pounds to resist. At the same meeting Mr. Cushman of the Bureau of Tests, Agricultural Department, called attention to the great number of complaints reaching the Department in regard to the short life of the wire now used for fencing, most of which lasts only about four years, as compared with that of the wire made 25 or 30 years ago, some of which is still doing good service. An investigation of the matter is now under way in the Department, but has not progressed far enough for results to be stated.

The composition of the pig iron that can be economically handled by the Roe process covers a much greater range in all the elements than that used in hand puddling, thus giving the blast furnace a greater range for selection among the non-Bessemer ores and fewer misfits in production.

The Roe process embraces the following conditions, all of which are necessary for the production of wrought iron of a high grade and at a low cost:

1. Mechanical means for puddling.
2. Handling large units.
3. Speedy and continuous running.
4. Simplicity in machinery and operation.
5. Minimum amount of handling from blast furnace to finished product.
6. Uniform and controllable product.
7. Physical and chemical homogeneity of product.

It is to be noted that these conditions are those which form the prime factors in the manufacture of high quality low cost steel at present, whether by the Bessemer or the open hearth process, and it is believed that a like development of them can be obtained in the Roe process with equally momentous results.

Dover Furnace Sold.—Within the past week negotiations were closed by which M. A. Hanna & Co., Cleveland, purchased a controlling interest in the Penn Iron & Coal Company, Canal Dover, Ohio, and thus came into the management of Dover Furnace and other property of the latter company. The furnace was blown in on June 5, after having been idle since August 1, 1904. A conversion contract with the National Tube Company, under which shipments were made to the Lorain, Ohio, Steel Works of the latter did not expire until May 31, 1905, but for the last ten months of the contract deliveries were suspended at the request of the steel company. The old stockholders of the Penn Iron & Coal Company retain about one-third of their original holdings, and S. W. Croxton, president and general manager, and J. P. Burton, treasurer, of the old organization, will be on the new Board of Directors. Mr. Croxton has been connected with the furnace for 40 years. Dover Furnace was built in 1854 and was blown in in 1855. It has been rebuilt three times—in 1878-1879, 1895 and 1903. It is 20 x 85 feet and has all modern equipment. M. A. Hanna & Co. will sell all the product of the furnace, which will consist of the Mabel malleable and foundry irons, formerly made at Mabel Furnace, Sharpsville, Pa., when under the control of M. A. Hanna & Co.; also of the Tuscarawas foundry iron, heretofore made at Canal Dover, as well as Bessemer and basic irons.

Work is going on day and night on the extension of the Bessemer & Lake Erie Railroad from Queen Junction to New Castle, Pa. Over 3000 men are said to be at work. This extension is also to go to Youngstown, Ohio, at a later date. It appears to be one of the greatest improvements of the year by the United States Steel Corporation, owner of the road.

THE IRON AGE

1855—1905.

New York, Thursday, June 15, 1905.

DAVID WILLIAMS COMPANY, - - - - - - - PUBLISHER
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A. I. FINDLEY, - - - - - - - - - } EDITORS
RICHARD R. WILLIAMS, - - - - - - - - HARDWARE EDITOR

Our Iron and Steel Production in 1904.

We are indebted to James M. Swank, general manager of the American Iron and Steel Association, Philadelphia, for advance information from his forthcoming annual statistical report, which we give in the following table, showing a comparison of the production for the two years 1903 and 1904 of iron and steel in the United States:

Articles.	Gross tons. 1903.	Gross tons. 1904.	Per cent. + Increase. — Decrease.
Pig iron	18,009,252	16,497,033	— 8
Spiegeleisen, ferromanganese and ferrophosphorus, included in pig iron	192,661	220,392	+ 14
Bessemer steel	8,592,829	7,859,140	— 9
Open hearth steel	5,829,911	5,908,166	+ 1
Crucible steel	102,434	83,391	— 18
Blister and patented steel	9,804	9,190	— 6
Total steel	14,534,978	13,859,887	— 5
Open hearth steel castings	400,348	302,834	— 24
All kinds of steel castings	430,265	330,211	— 23
Bessemer steel rails	2,946,756	2,137,957	— 27
Open hearth steel rails	45,054	145,883	+ 223
Iron rails	667	871	+ 30
Total production of rails	2,992,477	2,284,711	— 23
Structural shapes	1,095,813	949,146	— 13
Iron and steel wire rods	1,503,455	1,699,028	+ 13
Plate and sheet iron and steel, except nail plate	2,599,665	2,421,398	— 7
Bar, bolt, hoop, skelp, rolled axles, rolled armor plate, &c.	4,952,185	4,597,497	— 7
All rolled iron and steel, including nail plate and excluding rails	10,215,220	9,728,670	— 4
All rolled iron and steel, including both nail plate and rails.	13,207,697	12,013,381	— 9
Tin plates and terne plates	480,000	458,000	— 4
	Kegs of 100 pounds.		
Cut nails and cut spikes	1,435,893	1,283,362	— 10
Wire nails	9,631,661	11,926,661	+ 23

Some of the statistics for 1904 which are given in this table have already been printed in the publications of the American Iron and Steel Association and have been reproduced in these columns. We refer to the figures for pig iron, Bessemer and open hearth steel and rails. By far the greater part of the figures given above for 1904 is, however, published for the first time. These figures cover practically the entire field of iron and steel production, as they not only embrace pig iron and steel ingots, but also all the principal classes of finished iron and steel.

It will be observed that, notwithstanding the general depression prevailing in the iron and steel trade in 1904, an increased production is shown in several lines. An interesting case in this respect is in the production of open hearth steel. The increase was not great, as it amounted to only 78,255 tons, but it is significant of the encroachment of open hearth steel on Bessemer steel that in a time of general depression the output of this class of product should increase. It would appear that this was due to the production of open hearth steel rails, of which more than 100,000 tons of a gain were recorded in 1904 on the previous year.

Another notable direction in which an increase is shown is in wire rods, in which a gain over 1903 was made of 195,573 tons, or over 13 per cent. This was due to the greater demand for wire nails, as will also be observed from the table above given. We have several times alluded to the expectation that the production of wire rods will eventually surpass that of rails. It is therefore interesting to note in this connection that the production of rails last year showed a falling off of over 23 per cent. in the face of the large increase in the output of wire rods. The tonnage of wire rods made was nearly 75 per cent. of that of rails.

The decline in the production of pig iron was greater than the decline in the production of steel. Pig iron fell off 8 per cent., or 1,512,219 tons, as compared with 1903, while steel declined only 5 per cent., or 675,091 tons. This is partly explained by the increase in the production of open hearth steel, involving a heavier consumption of scrap than in the preceding year.

It is particularly noteworthy that in the production of crucible steel such a heavy decline should take place as is shown in the table. This decline amounted to 19,043 tons, or very close to 19 per cent. Crucible steel is regarded as a comparatively stable product, but in 1904 the demand must have fallen off very sharply. Steel castings also felt the depression severely, as they suffered a shrinkage of 23 per cent.

Plates and sheets held up well during the depression, as their production fell off but 7 per cent. Tin and terne plates decreased only 4 per cent., which is somewhat surprising, as that industry was supposed to have felt the depression more seriously.

The Sheet and Tin Plate Situation.

The wage scales for sheet and tin plate mills proposed by the Amalgamated Association, with their advances of 18 per cent. for sheet workers and 22 per cent. for tin plate workers, direct attention to two features of these important departments of the iron trade. One is the large amount of capacity already operated regardless of the union; the other is the large scale of production in recent months in both sheet and tin plate.

The contest of 1901 between what was then the American Sheet Steel Company and the Amalgamated Association ended in the loss by the union of a number of sheet mills that had always been under its control. Since that time the Steel Corporation has been in position to run its nonunion mills comparatively full if desired, and shut down those plants which by reason of limitation on output are to that extent less economical to operate. Suggestive in this connection are the figures showing the present distribution of Steel Corporation and so-called independent sheet and tin plate mills, as between union and nonunion. The Steel Corporation owns 15 sheet plants, containing 163 mills. Of these only 5 plants containing 47 mills are under union rules. The independent producers have 24 plants containing 145 mills. Of these 13 plants with 90 mills are union. Thus the Steel Corporation has 29 per cent. of its capacity operated by union men, while the outside producers have 62 per cent. so operated.

In tin plate the percentages of union and nonunion capacity owned by the Steel Corporation are practically the reverse of those in the sheet trade. Of 19 plants with 242 mills owned by the corporation, 12 plants with 171 mills are union, or about 70 per cent. In the case of the independent companies, out of 14 plants with 91 mills 11 plants with 68 mills are union.

It has been a matter of note that both in number of mills in operation and in average output per mill unprecedented records were made in the tin plate industry through most of the five-months period ending with

May. As against an estimated output of 480,000 gross tons of tin plates in 1903 and 458,000 tons in 1904, it is probable, taking the known output of particular mills, that the rate in the early part of this year was quite beyond 700,000 tons a year. Practically every tin plate mill of the United States Steel Corporation was active from January well into May, and the independent mills even increased upon their good aggregate output of the fall of 1904. The sheet mill output has been likewise unprecedented. Yet with the end of the scale year close at hand, when ordinarily capacity is worked to its utmost to accumulate stock against the summer shut down, there has been in the past few weeks a slackening of operations at tin plate and sheet mills, and this curtailment has been sufficient to cause a considerable reduction in shipments of steel to such plants, and the shortened requirements of steel works have made possible the blowing out of a number of blast furnaces of the Steel Corporation. It is under these conditions that the sheet and tin plate wage conferences meet to consider a restoration of wages to a basis prevailing when No. 27 black sheets were $9 a net ton and tin plates $5 a net ton above the prices of to-day.

Union Restriction of Output.

Notwithstanding the disclaimers that go up from spokesmen of the labor unions when these organizations are taxed with deliberately aiming to curtail output, facts as they come out from time to time tend to establish the charge and refute the protests. President Bacon of the Tennessee Coal, Iron & Railroad Company in his last annual report gave specific data as to the decreased efficiency of labor in that company's coal mines under union domination. Referring to the introduction of nonunion workmen since the miners' strike on July 1, 1904, he said that at the Gamble mine in Walker County, Ala., the product per man per day has increased 1½ tons in the past 11 months, and the earnings per man per day have increased 52½ cents. Naturally, with increased output there has been a reduced cost to the company per ton of product, and both employer and employed have been benefited. President Bacon is careful to say that there has been no change in the mine in the manner of working or in the equipment, but that the increased output and earnings are due solely to greater capability and effort on the part of the men.

The old trade unionism, that has developed into such perfect domination of many industries in Great Britain, had as one of its cardinal principles, "the most work for the most men," the aim being to make the supply of work go farthest in employing those whom the union had engaged to keep in work and wages. That rallying cry has been modified in the later development of trade unionism in the United States, and we hear representatives of some of the most intelligent and reputedly best conducted unions in the country asserting "a minimum of work for a maximum of pay" as the mainspring of union effort. Advocates of this doctrine assert that it is an offset to the employer's constant strain for a maximum of output at a minimum wage. But this last by no means represents the position of the advocates of intensified production. What they seek is not a minimum wage, but a minimum of unit cost, a very different thing. Attending it may often be, and actually is to an increasing degree, a maximum wage. Repeatedly it has been the case under the operation of the "premium" system of remuneration that wages have reached high record marks for the individual and the establishment. Advocates of the "least-work-and-most-pay" policy need to remember that even if they are taking manufacturing and selling monopolies, so-called, as their pattern, they are not good imitators of the latter. The fact is that monopolies, in the light of experience and of latter-day knowledge of economics, do not exact a maximum price for a minimum of material or service. They have constantly before them the stimulus high prices give to potential competition, and the weapon the consumer always has—curtailment of consumption or refusal to buy except at a reasonable price. Many grievous mistakes are to be charged to combines and pools in connection with price fixing, but it is to be said that they have rarely made their own dictum the sole basis for a given price.

In the case of machine shop and foundry work the claim has been made by employers that restriction of output is directly aimed at by the union. Where agreements have been entered into between employers and the machinists' or the molders' union no-limitation-of-output provisos have been a feature. Yet one of the functions of the Molders' Shop Committee is to decide, often in advance of any test, how many castings a day shall be made from a pattern that has just come into the shop. The premium plan, which has done for the machine shop, and on a smaller scale for the foundry, what the introduction of nonunion men did at the Gamble mine—increasing output and wages and reducing the cost per ton—has been resisted by the molders' union, as it has been steadily opposed by the machinists' union. As ground for this opposition it is urged that the premium plan is only a modification of what the unions regard as the vicious piece price system, and that the union must prevent a greedy scramble for high wages by workmen who take no account of the pace they are setting for the less capable at the same time that it guards the health of its members against the overexactions of labor-driving foremen and superintendents.

While these reasons are given when the question is up for public discussion, the trouble is that the union policy on output is to disregard as long as possible the effect of improved machinery, to ignore the conditions forced upon employers by enterprising competitors, and to disregard the plain tendency in all industry toward the cheapening of all products and the consequent increase in their consumption. It is on these accounts that the union position on the matter of output is constantly subject to a suspicion which experiences like that cited by President Bacon tend to confirm.

A Big Wheat Crop Promised.

Notwithstanding the circulation of numerous reports that the winter wheat crop had suffered serious deterioration, the Government report for June, issued on Saturday, indicates a yield of 727,432,000 bushels of wheat for this year, which exceeds the total harvested a year ago by about 170,000,000 bushels. The report states that winter wheat showed a deterioration of but 7 points during May, the condition on June 1 being given at 85.5, as compared with 92.5 on May 1. The first report on the condition of spring wheat for the year was made at the same time, the condition being 93.7, as compared with a condition of 93.4 a year ago and a ten-year average at this season of 94.4. Since the first of the month the weather has been decidedly favorable to the progress of the crops, so that instead of further deterioration there has undoubtedly been an improvement. These figures are of very great interest to manufacturers and merchants, as they indicate that the crop prospects for this year are distinctly favorable.

With a large crop of wheat, a very substantial basis will exist for expecting a good condition of business for the last half of the year.

The Drawback System Wrongfully Criticised.

A Washington dispatch states that Senator Hansbrough of North Dakota has criticised Secretary Shaw for being so free in his drawback policy, declaring that this is one cause of the Treasury deficit, as about $5,000,000 was paid out in drawbacks last year. It appears to us that the Senator should look in other directions than the drawback system for the application of economy in endeavoring to bring the Government expenditures within the revenues. Quite a number of wide open channels exist in the matter of national expenditures in which economy could be enforced, involving much larger sums than those paid out to manufacturers under the drawback system. Those who, like the Senator, are of the opinion that too much of the Government revenue is being paid out for drawbacks should understand that much of the foreign material imported for the purpose of securing the drawback, in cultivating an export trade, would not be brought into this country but for the advantages offered by the drawback system. In many cases domestic material would not take the place of the imported material, as the cost of the former would make the cost of the manufactured article too great to enable it to be sold in foreign markets. The drawback system is one which needs to be extended rather than curtailed.

China's Threatened Boycott.

The threatened boycott of American goods in China should be very easily remedied if the resolutions of the Shanghai Chamber of Commerce reflect the general Chinese position. It appears that there is no complaint of the exclusion of the Chinese laborer. The resolution of the Chamber of Commerce, addressed to the Board of Foreign Affairs of the Chinese Government, states: "We beg to inform you that the community are discontented with the present situation and all those connected with this body have decided to cease all traffic in American goods until such time as a satisfactory settlement is arrived at. As this matter concerns all classes throughout China we sincerely desire that you will instruct our Minister to withhold his signature until the right of entry into America is accorded all traders, students and gentry." If a system could be developed so that the classes named might be given the right of entry without making possible the wholesale migration of Chinese probably no one would object. America does not wish to see her goods boycotted at a time when the keenest efforts are being made by Europe to get more than its share of the Chinese trade, the tremendous future possibilities of which are being better and better understood.

New Castle Blast Furnace and Steel Works Closed.—Last week the Carnegie Steel Company banked three of its blast furnaces at New Castle, Pa., while the fourth stack, known as McKinley Furnace, was blown out and will be extensively repaired. The latter stack has been in steady operation for two years and needs relining and other repairs. The Bessemer plant at the New Castle Works is also closed, mainly on account of an accident in the blooming mill, which will take several weeks to repair. The Shenango and Greer works of the American Sheet & Tin Plate Company, at New Castle, Pa., get their supply of tin bars from the New Castle Steel Works, but since this plant is closed will depend upon the Ohio Works of the Carnegie Steel Company, at Youngstown, for their tin bars. It is expected that the steel works at New Castle will be in shape to start up about July 1 or shortly after, and when put in operation it is probable the three blast furnaces which are now banked will also be started.

Latest Customs Decisions.

Steel Forgings.

After months of deliberation the Board of United States General Appraisers, in a decision written by Wilbur F. Lunt, has overruled a protest filed by Thomas Prosser & Son, New York, it being held that certain steel crank shafts, crank axles, connecting rods, crank pins, cross heads and piston rods are dutiable at the rate of 45 per cent. ad valorem as "manufactures of steel not otherwise specially provided for." It was maintained by the importers that the merchandise was dutiable either as "steel forgings," with duty at the rate of 35 per cent. ad valorem, or else at the assessment provided for under paragraph 135. Neither of the claims of Prosser & Son is considered as meritorious by the board. All of the merchandise is the product of the Krupps of Germany.

The Prosser case has attracted considerable attention in importing and customs circles owing to the peculiar transfer of the protest from one sub-board to another. It developed last fall that General Appraiser Fischer, chairman of sub-board 2, had written a decision sustaining the claims of Prosser & Son. Before the decision was promulgated, however, General Appraiser Lunt interfered and insisted that jurisdiction in the case be transferred to his division of the customs court. Mr. Lunt made it clear at the time that he regarded Mr. Fischer's decision erroneous and in conflict with previous decisions of the General Board. The incident created considerable ill feeling in the customs tribunal. It was finally decided by vote of the full Board of Appraisers to take the case out of the hands of sub-board 2 and transfer it to the sub-board of which Mr. Lunt is chairman. General Appraiser Lunt's colleagues, Thaddeus S. Sharretts and Charles P. McClelland, agree in the conclusions reached by the chairman.

Attorneys for Prosser & Son say that an appeal will be taken from the board's decision. The right of the General Board to arbitrarily transfer an importer's protest case from one sub-board to another, together with the question of the classification of the merchandise, will be challenged in the United States Circuit Court. It is expected that the case will come up for argument in October.

Grinding Disks.

General Appraiser Lunt also writes a decision dealing with the classification under the tariff law of cast iron grinding disks imported by Prosser & Co. The importing firm objected to the assessment of 45 per cent. ad valorem imposed by Collector Stranahan. The firm's contention for duty at the rate of 8-10 cent. per pound, or at 35 per cent. ad valorem, was overruled.

Charcoal Bar Iron.

In a decision written by General Appraiser Fischer the Board of Appraisers on June 7 overruled a protest filed by the Jones & Laughlin Steel Company, Chicago, and held that charcoal bar iron is dutiable as assessed by the collector of customs at Chicago at the rate of $12 per ton. The importers specified in their claim that the merchandise was properly dutiable at ½ cent per pound.

The United States Circuit Court of Appeals on June 12 handed down another opinion in the long litigation of the Westinghouse Air Brake Company and the New York Air Brake Company. The verdict of the court below is reversed. The litigation was over the use of the Westinghouse quick acting triple valve, an automatic air brake attachment. The court had allowed the Westinghouse Company $36,995 of realized profits and $165,682 of diverted profits. The Circuit Court of Appeals says that the valve is only an attachment, and orders that the court below find that the profits from its use are merely nominal.

The Columbia Tool Steel Company.

The New Western Tool Steel Plant.

In *The Iron Age* for June 1 was announced the fact that the Columbia Tool Steel Company had started into full operation its new plant at Chicago Heights, Illinois. This plant is interesting in many ways. Built according to the latest engineering knowledge in the tool steel industry, its arrangement is the best that could be devised, and for this reason it contrasts strongly with many older mills which, as is apt to be the case, are compromises with space and the results of successive additions as the business developed.

The present plant consists of two buildings—the office building and the factory—but about 8½ acres of ground are owned by the company, and its plans contemplate the erection of other mills to operate in conjunction with the one now operated. The office building is 40 x 42 feet in size, two stories, built of brick and equipped with modern office conveniences.

The factory building, known as the crucible department, is 75 x 350 feet, 28 feet high to the eaves and 56 feet to the apex of the ventilator. The roof of this building is tile, laid on steel supports, which, with brick walls and steel trussed roof, makes the building fire proof. Four annexes are added to the building—namely, the shear room, 50 x 50 feet; boiler room, 50 x 50 feet; machine shop, 25 x 50 feet, and the shipping room 75 x 43 x 23 feet. The total floor space in the manufacturing department is at present about 35,000 square feet.

The main building, or crucible department, is laid out in three sections. The eastern section includes the furnaces, the middle section the rolling mills and the western section the heating furnaces and hammers. Railroad switch tracks are arranged to bring raw materials for the melting department directly into the building to supply fuel to the boiler annex and to permit the loading immediately on cars of the finished materials from the shipping annex.

Taking the departments in the order of the progress of materials, the shearing annex is equipped with shears for cutting Swedish iron and American muck bar to crucible sizes. Here the material is weighed out and trucked to the melting floor. The melting furnace is of the Siemens-Martin type and of 30-pot capacity. Heat for this furnace is provided by two Swindell gas producers, from which it is piped through the checker work of the reverberatory crucible furnace. Pouring into molds is done in the usual way, and a large variety of molds is provided, ranging from the smallest up to a series of 12-pot molds. Ingots thus cast are transferred to the reheating furnace on trucks.

The Rolling Mills.

In the center of the building is located a 14-inch rolling mill furnished by the Lewis Foundry & Machine Company, Pittsburgh. It has three three-high and one two-high stands. Fifty feet farther west, on the Belgian plan, is located a five-stand 9-inch mill of the same make, with four three-high and one two-high sets of rolls. The mills, as may be inferred, may be operated in conjunction with each other or individually. They are both operated by the same engine, and are so arranged that one, several or all of the stands may be operated at one time, making it possible to change rolls on one or several stands at the same time. The bearings are water cooled, and the spindles, boxes, &c., are made from cast steel rather than iron.

The mills are in every way modern, and the liberal supply of water available at the plant makes it unnecessary at present to provide for a means for storing and reusing. The heating furnaces for the rolling mills are both placed back of the 14-inch mill, and the waste heat is carried through tunnels into a 200 horse-power Wickes vertical water tube boiler adjoining. These furnaces are coal fired.

The Mesta Engine.

Both mills are operated by the same engine, which was built by the Mesta Foundry & Machine Company, Pittsburgh. This is the first engine of this type built by the company, and its success is proving the wisdom of its designers. It is a 24 x 36 engine, utilizing steam at from 125 to 150 pounds pressure, and it has a cut off ranging from zero to three-quarters of the stroke. At 120 revolutions per minute it develops 650 horse-power under normal conditions, but when an ingot enters the roll this power is raised automatically to an extreme of 1050 horse-power within the limits of safety. It may be described as an engine combining the Porter-Allen type of governor with the Buckeye valve, except that it has two eccentrics, one for each valve. The stroke of the cut off is regulated by a link and block motion, the link mechanism being attached to one eccentric. The governor raises and lowers the block in the link to change the travel of the valve.

After the bars are rolled they are for the present cooled and straightened on the slab iron floor, but a cooling bed 70 feet long by 8 feet in width is being constructed with a straightening guide on one side. Possibly by the time this description is read this bed will be in operation, greatly facilitating both the straightening and cooling of the bars. The rolling capacity of the plant is at present much in excess of the melting capacity, both to provide for the expected growth of the plant and to minimize the labor of roll changing. At present rolls are installed for 95 per cent. of all the sizes that are made by the company or that are in at all common demand. All sizes can be rolled up to 3¾-inch round, or equivalent section, the general practice being to finish larger sizes under the hammers.

A 7½-ton Pawling & Harnischfeger traveling crane, of 75-foot span, which serves the central portion of the building, facilitates roll changing and the installation of machinery.

At the western end of the building are located coal fired reheating furnaces in conjunction with a second 200 horse-power Wickes waste heat boiler and four steam hammers furnished by the Morgan Engineering Company, Alliance, Ohio. These hammers are respectively 750, 1400, 3500 and 6000 pounds capacity. The last named is being equipped with a jib crane to facilitate handling of materials. The two smaller hammers are operated at very high speeds and are used for turning out rounds, squares, flats, octagons and other shapes in high grade hammered tool steels. The machinery equipment of the plant also includes shears which are operated by separate motors. There is also being installed a large Lewis shear built to cut high carbon billets up to 6 inches square. This tool has an independent engine drive, steam being conveyed to it from an adjoining Wickes boiler.

The machine shop includes a motor driven roll lathe, a grinder and drill press and other tools. This equipment will be augmented as necessity demands. Aside from the two 200 horse-power Wickes water tube boilers, which are operated wholly by waste heat, a third boiler of the same type, 250 horse-power, hard coal fired, is located in the boiler room annex, space being provided for an additional 250 horse-power boiler if required. Whatever disadvantage this Western plant may have in the increased cost of gas coal is more than counteracted by the saving effected by the two waste heat boilers. It is estimated by the company that these two boilers alone effect a net saving of $40 to $50 a day.

The Storage and Shipping Room.

An irregular shaped annex at the northwestern corner of the building is devoted to shipping. Here racks are erected for storing finished shapes, so that each separate shape has its own division, and there are also installed shears for cutting and anvils for cropping the finished bars. Cars on the side track immediately adjoining may be loaded with one handling of material.

The melting capacity of the plant at present is only about 10 tons a day, while the finishing capacity is about 35 tons, but provision is made for adding three additional 30-pot melting furnaces as soon as the volume of business demands it.

A feature of this plant is the great hight of the roof and the liberal provision made for light and ventilation. It is spoken of by the men at the melting furnace as the coolest melting floor in the country.

In its executive officers, its selling force and its skilled

operatives this plant has drawn very largely from the *personnel* of the Crucible Steel Company of America and its constituent companies. The plant is already in operation, and about 10 tons of high grade tool steel and machinery steel and allied products are turned out daily. It enjoys superior transportation advantages, as its side tracks connect immediately with the Elgin, Joliet & Eastern or outer belt road surrounding Chicago, the Michigan Central, the Chicago & Eastern Illinois and the Chicago Terminal Transfer roads. Advantageous switching arrangements have been made, so that the cost of shipping to points outside of Chicago is the same as Chicago freights and the charge for shipping to Chicago is only nominal. E. T. Clarage is president of the company; Frank Matthiessen, vice-president; Alexander B. Peterson, secretary, and M. H. Kilgallen, treasurer.

Michigan's Quinquennial Industrial Census.

WASHINGTON, D. C., June 13, 1905.—The first bulletin of the quinquennial census of the industries of the United States has been completed by the Census Bureau. It embodies the statistics of the industries of the State of Michigan, which have been compiled very expeditiously.

Foundry and Machine Shop Products.

The manufacture of foundry and machine shop products ranked second among the industries of the State, according to the value of products reported in 1904, standing next to the lumber industry, which overshadowed all others. Between 1900 and 1904 there was an increase of 3466, or 25.6 per cent., in the number of wage earners employed in the foundries and machine shops and of $10,890,331, or 52.8 per cent., in the value of products. Almost half of the total value of products is reported by the establishments in Detroit. Bay City, Saginaw, Grand Rapids and Kalamazoo also reported a large value of products. The manufacture of stoves and furnaces is an important branch of the foundry and machine shop industry in Detroit, where the six establishments reported for 1904 gave employment to 3122 wage earners and had products valued at $5,564,609, which is exclusive of gas and oil stoves. The class of foundry and machine shop products includes also establishments manufacturing metal working machinery, steam pumps and pumping machinery and stoves and furnaces. These were not separately reported in 1900 and therefore a comparative statement cannot be presented, but the total products in 1904 of these various branches are given as follows: Metal working machinery, $1,290,495; steam pumps and pumping machinery, $675,561; stoves and furnaces, $7,112,874. The following table presents a comparison of the statistics covering the foundry and machine shop products for the two census periods:

	1900.	1904.
Establishments	364	419
Capital	$19,595,771	$24,290,075
Wage earners	13,502	16,958
Wages	$6,527,496	$9,176,471
Miscellaneous expenses	$1,540,950	$3,349,148
Materials	$8,222,862	$12,907,799
Products	$20,615,864	$31,506,195

Copper Smelting and Refining.

The smelting and refining of copper in 1904 ranked fourth in the value of products, which amounted to $21,222,217. The value was greater by $3,882,176, or 22.4 per cent., than it was in 1900, as will be seen from the following table:

	1900.	1904.
Establishments	3	3
Capital	$1,523,407	$2,378,315
Wage earners	462	650
Wages	$364,647	$454,943
Miscellaneous expenses	$33,685	$407,119
Materials	$16,754,220	$18,807,701
Products	$17,340,041	$21,222,217

Automobile Industry.

The industry fifth in importance in 1904, according to the value of products, was the manufacture of carriages and wagons, including automobiles, which were not separately reported in 1900. The 33 establishments engaged in 1904 in producing automobiles and separate parts had a combined capital of $4,346,867 and paid $1,267,835 in wages to 2735 employees. The miscellaneous expenses amounted to $1,478,990, the materials to $3,443,052, and the value of the products was $7,996,534, or about one-third of the total value reported for the entire carriage and wagon industry of the State.

From a business point of view the automobile industry in Michigan had its birth in the city of Lansing. As early as 1887 R. E. Olds invented and built a gasoline horseless carriage and operated it on the streets of Lansing. The success of this automobile led to the building of another in 1888, the merit of which resulted in the formation of a company with a capital of $50,000 to engage in the manufacture. The organization of this company was promptly followed by that of other companies in a number of cities of the State. The industry has so steadily increased that Michigan now ranks among the first States in the manufacture of automobiles. Lansing claims the distinction of producing more automobiles than any other city of its size in the world, and likewise of having in actual use on its streets one automobile to every 150 inhabitants. The largest factories are located in Detroit, Lansing and Grand Rapids, in the order named.

Iron and Steel.

The manufacture of iron and steel in 1904 is covered by reports from 11 blast furnaces and four steel works and rolling mills. In 1900 these separate classifications were not observed, the total number of establishments reported being ten, showing a 50 per cent. increase in 1904. The details of the industry for the two periods are shown in the following table:

	1900.	1904.
Establishments	10	15
Capital	$3,859,050	$5,795,551
Wage earners	1,972	1,939
Wages	$941,091	$1,018,699
Miscellaneous expenses	$277,827	$360,941
Materials	$3,770,213	$4,821,011
Products	$5,902,058	$7,140,652

Iron and Steel Shipbuilding.

The statistics relating to iron and steel shipbuilding in 1904 reflect the unfavorable conditions prevailing throughout the country in this industry. While the number of establishments increased from three to five and a small increase in the amount of capital is reported, the number of wage earners and the value of the product declined. The detailed returns for the industry are as follows:

	1900.	1904.
Establishments	3	5
Capital	$3,087,164	$3,126,832
Wage earners	1,796	1,346
Wages	$869,366	$770,953
Miscellaneous expenses	$109,687	$207,450
Materials	$1,654,348	$684,099
Products	$3,029,203	$2,029,835

It should be understood that by the term "capital" in this report is meant tangible assets only, including land, buildings, machinery, tools and implements, cash and sundries. No attempt is made in this connection to furnish figures covering stock or bond issues. W. L. C.

The Seattle Steel Company.—This company's new steel plant, at Humphrey, near Seattle, Wash., is now in operation. The product consists of bar iron, light rails and fastenings and structural iron and steel. The output is about 50 tons of rolled steel per day, though the capacity of the plant is three times this amount. Only scrap iron is used at present. The officers of the company are E. M. Wilson, president and general manager; Wm. Pigott, vice-president and treasurer; W. S. Burt, secretary.

Scottdale Furnace Company.—This company has been granted a charter, the incorporators being James Corrigan and Price McKinney of Cleveland, and Amos E. Gillespie of Scottdale, Pa. It is an identified interest of Corrigan, McKinney & Co., Cleveland, and will operate under lease Charlotte Furnace, at Scottdale, Pa., owned by the United States Cast Iron Pipe & Foundry Company. The stack has been run under lease by Corrigan, McKinney & Co. for several years, and has a daily capacity of about 275 tons.

Important Mesaba Railroad Extension.

DULUTH, MINN., June 10, 1905.—In a recent article describing the western Mesaba interests of the United States Steel Corporation I said that the Duluth, Missabe & Northern Railroad would probably soon be extended to that section. Contracts for this extension have just been let and the work is to be ready the coming winter, so that ore may be hauled out in quantity during the season of 1906. These railroad contracts have been let to three firms in order that they may be carried through rapidly. The new line is to branch from the present main line of the Duluth, Missabe & Northern road at Alborn, a station 30 miles northwest from Duluth, and it will run in a northwesterly direction 55 miles to the village of Bovee, which is at the Canisteo group of mines, in the southwest corner of T. 56, R. 24. Branches will be run from this new main line to Holman and Arcturus mines, a short distance northeast, and to other properties that may be proved as mines or may hereafter be acquired by the United States Steel Corporation, or to others from which the Duluth, Missabe & Northern can secure traffic contracts. The cost of this line will be in the neighborhood of $1,500,000. It will be a single track at first, but as the traffic will be at least 1,500,000 tons a season, and may soon materially increase from that, it will shortly be double tracked. The Duluth, Missabe & Northern is now completing the double tracking of all its lines from Duluth to the central Mesaba range. There is a minimum tonnage in the Canisteo leases of 1,500,000 tons annually, and this will be materially increased by the surrounding properties the corporation has secured in that vicinity and from independent mines whose ore the road may handle. These figures give an indication of the importance of this new road and of the vast increase it will bring to the ore traffic centering at the docks at Duluth.

Mines to Be Pushed to the Limit.

There is a tendency this year, with the good prices for ore and a sharp demand, to push mines to the limit and make a production that shall be as large as possible. This tendency is well shown in its extreme by the situation of a Mesaba mine that is making its first shipments this season. It is a small property, probably 1,000,000 tons total tonnage in sight, and it was partially stripped last year so that mining might begin when the market should show what seemed a proper price. A number of offers at $2.85 a ton received last year were refused, but this year the mine has sold 200,000 tons at $3.40, which on account of an improvement in the grade over guarantee will be exceeded by several cents in final adjustments. Now this is a small property and is to be mined by the milling process. There was not even a railroad track to it up to two weeks ago, and yet it has sold and fully expects to deliver 200,000 tons this year. It is the intention of the operators to mine this property out in the two years ending with 1907, to do which they will have to produce 300,000 to 400,000 tons a year. They feel that ore prices are liable to remain at a high notch for the coming two or three years, perhaps longer, but that in time there is sure to be one of the reactions that seem to come with reasonable regularity, and they want to have their property cleaned out before there is any reaction. If a new small property of this kind can be made to produce such a tonnage in three years under the disadvantages that this property has suffered up to this time it is a fair presumption to believe that the output of the Mesaba can be very greatly accelerated all along the line, and this is the case in fact. There are known to be many independent operators whose ideas and plans coincide with those of the owners of this mine and they are likely to act in a somewhat similar way. Of course this may have its effect on ore prices for 1906, and there may be a decline, not from a diminution of demand, but from excessive tonnage on the market.

Operations at Various Mines.

Webb mine, which the Shenango Furnace Company (W. P. Snyder & Co.) is now engaged in opening, is probably not to be stripped. There are rock strata in the ore bodies of this mine that make it desirable that it shall be mined underground. The same company is mining its Shenango with far more vigor than before and will produce about 300,000 tons this year. This is probably about the amount that it has credit for with the fee owner in royalties already paid. The mine is a very large one, having not far from 20,000,000 tons, and it will be necessary to mine from 600,000 to 700,000 tons a year if the mine is to be cleaned out in the life of the leasehold.

The extent of stripping operations is being widened, the latest to announce the stripping of a deposit being Pickands, Mather & Co. for their Utica mine, at Hibbing. This is a fairly large mine and is located under the old stripping dump of the Mahoning; indeed, the shaft by which it has so far been mined was sunk through this dump. It is one of the curious commentaries on the methods of early day Mesaba operations that this should be true and that a mine over a part of which there is now a dump 40 feet deep should now be thought near enough to the surface to be stripped.

The explorations that have been under way at Negaunee for some time are to be added to by drills at work in the old race track ground, which is now the property of the Oliver Iron Mining Company and which it expects to thoroughly explore. This is adjoining Maas mine of the Cleveland Cliffs Company, and the deposit of one should continue to the other. The company owns four or five strips of land in this basin, bought by it when there was rivalry between the two concerns as to the control of the Negaunee basin. A short distance from Marquette there is to be some new exploration in what is called the junction basin, where favorable indications were found years ago near Moore mine, in the Cascade district. Corrigan, McKinney & Co. are now working at their old Star West mine, re-exploring the property, which has been idle a number of years. Ore has been found, it is reported, and the indications are that it is in considerable quantity. Explorations will be undertaken at other old properties in that district and there will be a great deal of work all along the Marquette region during the year.

The workings of Germania mine, on the Wisconsin end of the Gogebic, have been unwatered and mining is to resume. The shaft is to be driven deeper and a good deal of underground exploration undertaken. At Ottawa mine unwatering has been completed and shipping ore begins as soon as the property can be put in shape. At New Davis mine, near Ironwood, the Wisconsin Manganese Ore Company is reorganizing and expects to develop the mine on a larger scale and carry on extensive operations. This mine lies adjoining Newport of the Schlesinger group and Geneva of the Oliver Company. Newport has been proved a very big mine and recent reports are to the effect that its lessees have refused flat offers of $2,000,000 for their interests. This added value in what was not long ago considered about "all in" is due to explorations at the Bonnie end of the mine, next the New Davis, as well as to deeper work in the western end of the mine, where ore has been found at the depth of 1800 feet.

In Canada.

At Helen mine, the only mine yet opened on the Michipicoten range, the Lake Superior Corporation is getting very satisfactory results and the value of the property has been materially increased. It is said that this year's operations are expected to return a very nice profit. In extending the mine a shaft has been sunk in the old Boyer Lake and this cuts the ore body 400 feet under its former exposure. This ore is said to be wider and better in many ways than above. The pyrites, that was previously injurious and made mining a matter of careful selection, has been running out and is not found where it might have been expected, though it is said that it appears to some extent elsewhere. The ore now mined is running several points better than that found in the early days of the mine. It is still mostly non-Bessemer and is shipped largely to the Hamilton Furnace and to merchant furnaces in the United States. This year's shipments will be larger than those of 1904.

Copper.

Lake copper production for May was about 19,015,000 pounds, which is to be compared with 17,660,000 pounds

for the corresponding month last year. In the month new figures of production were established by three mines—Champion, Michigan and Mohawk. The Copper Range output, including only half of Champion production, was at the rate of about 34,000,000 pounds per annum. The lake is now making copper at nearly a 230,000,000-pound rate, and there is no reason to doubt that this will be maintained, and even increased, for some time. Many of the important mines, such as Calumet & Hecla, Copper Range, Mohawk, Tamarack, Osceola and Isle Royale, are arranging for an increase. Indeed, the probable increase to be figured from Calumet & Hecla alone is from 12,000,000 to 14,000,000 pounds a year. New mines that are now looked on as assured producers to a considerable tonnage are Ahmeek, Allouez and Centennial, while there are others that should increase their now small outputs. There are also several prospects that are regarded as likely to become mines with time and sufficient funds for extensive exploration. The situation in the lake copper region with respect to the development and exploration of new lands is now quite similar to what it was during the day of 17-cent copper a few years ago, and the results are likely to be much the same. D. E. W.

Trade Events in Canada.

Bounty Payments.

TORONTO, June 10, 1905.—An item in the estimates of the Trade and Commerce Department was the occasion of some questions on the part of the Opposition and of some explanations on the part of the Government in the House of Commons yesterday. It was one of $11,000 for the administration of acts relating to bounties on iron, steel, lead, petroleum and binder twine. Mr. Foster, Finance Minister in the last Conservative Government and himself the author of the bounty system in Canada, was curious to know something about the service requiring the outlay provided in the item. He asked what sum had been expended in bounties this year, and was informed by Sir Wilfrid Laurier that it amounted to $1,300,000, divided as follows: Pig iron, $533,952; puddled bars, $11,669; steel ingots, $347,991; rolled products of steel, $15,320; lead, $195,628; petroleum, $167,205; binder twine, $25,452. Mr. Foster made the following remark:

> This is not the time, I suppose, to discuss the question of bounties, but I never thought I would have lived to look into the face of the leader of the Government and have the information given to me by the present leader of the House that the enormous sum of nearly a million and a half dollars was paid out by his Government in bounties.

Sir Wilfrid replied to another member that it is possible the lead bounty may be replaced by a duty when the tariff is revised, adding that there probably will be a revision before long. This is a matter that has recently been pressed on the attention of the Government by the Board of Trade at Nelson, British Columbia. That body a short time ago telegraphed to Ottawa a resolution urging the Government to take immediate action for increasing the duty on lead products and, in particular, for protecting the corrosion of lead. The effect of the lead bounty is discussed by the Provincial Mineralogist of British Columbia in his recent report of the mining operations of the Province in 1904. Speaking of its influence upon the lead industry of the Slocan district, he has this to say:

> In the Slocan district the most important feature to be observed in connection with mining was the effect that the lead bounty would have in stimulating lead mining, and it must be admitted that, as far as increasing actual production is concerned, the results have not been so great as was anticipated. There has been an increased amount of development going on, which seems attributable to the bounty, the effect of which will be felt later.

In the Southeast Kootenay district the results appear to have been better, according to the following statement of the Mineralogist:

> To those mines the lead bounty given by the Dominion Government was of more benefit than to almost any others in the Province, inasmuch as they were capable of producing a large tonnage of ore in which the silver values were so low, as compared with the lead, that the ore might properly be called a "lead-silver" ore, in contradistinction to those of the Slocan, which are silver-lead ores. To show what a material help this bounty has been it might be well to make a rough approximate calculation by way of illustration. At the St. Eugene mine it takes about 5 tons of ore to make 1 ton of concentrates. A ton of concentrates contains about 33 ounces of silver and 1300 pounds of lead. The gross value of this (taking silver at 50 cents per ounce and lead at 1½ cents per pound as approximate figures) would be, silver, $16.50, plus lead, $19.50; total gross value, $36. Now, the bounty on a ton of such concentrates, if smelted in Canada, would be $9.75, or about $2 per ton on the ore as mined, the gross value of which, without the bounty, was about $7.50. The same is nearly correct for the other properties. The result has been that there has been mined in Southeast Kootenay in 1904 about 80,000 tons of ore, as compared with 900 tons in 1903, while the present indications are that a further increase will be made in 1905.

Ontario Iron Ore Fields.

There is reason to believe that the new Government of Ontario will pursue a policy designed to make the ore lands of the Province more productive than they have been in the past. More energetic measures for this purpose would probably have been applied even had there been no change of Government. It is a case of the hour having struck, so to speak, when the force of circumstances compels action. The margin of New Ontario nearest the older settlements is not so sparsely peopled as it was. It has new lines of communication, such as the Algoma Central Railway's partial system and the Ontario Government's Temiskaniny Railway. Its development has come to be an object of interest to manufacturers and merchants in the advanced portions of the Province. All these conditions co-operate to push the Government into some course for the opening up of the region's resources. The Whitney Government has given strong assurances of its purpose to promote the welfare of the back country. It promises to create a new department, one devoted wholly to the mining affairs of the Province. It was not found practicable to carry out this promise literally, but the Department of Crown Lands was changed into the Department of Lands and Mines and a new Minister, Hon. Frank Cochrane, has been put in charge of it. He was selected because of his intimate knowledge of New Ontario and of his special acquaintance with the mining possibilities and needs of that great territory. He has carried on business for many years as a trader in hardware and kindred lines in the town of Sudbury, and has the reputation of being a very able man. Under his administration the mining interests of Ontario are likely to be well looked after.

Good work continues to be done by the Bureau of Mines in the northern fields. Dr. A. P. Coleman, Provincial Geologist, is in the Michipicoten district. He has recently advised Mr. Gibson, the head of the bureau, that an iron ore claim on Lake Anjigomi is being stripped and that the magnetite exposed is of excellent quality. A company is developing power at High Falls, on Michipicoten River, to supply electric energy to the Helen and other mines within the falls' radius. At the Helen mine Dr. Coleman found a scene of activity. A thousand tons of ore are being taken out daily and already 30,000 tons have been shipped. It has been ascertained that 180 feet below the Boyer Lake level the ore is as good and as plentiful as in the higher levels. A new shaft, 120 feet deep, has been sunk, giving access to good ore 400 feet below the original bed.

Mr. Gibson, the director of the Bureau of Mines, has been advised of the discovery of an iron ore body on English River, the boundary stream between Ontario and Keewatin district.

Besides sending out Dr. Coleman's party, which is making a systematic exploration of the Michipicoten district, the bureau has arranged to send other parties out, one of which will go to the Loon Lake iron region in and near the township of McGregor, east of Port Arthur, where L. P. Silver will examine and report upon the iron ore deposits, zinc ores and other minerals of the locality.

Quebec's Tax on Traders.

At the last session of the Legislature of Quebec Province a bill, introduced by the Provincial Treasurer, to produce revenue from business enterprises became law. One provision subjects commercial travelers and agents representing principals who have no place of business in Canada to a license fee of $300. This will fall heavily on

manufacturers' agents doing business in Montreal for houses in the United States, Great Britain and in European countries. It is estimated that there are about 1000 such agents in Montreal, many of them representing more than one foreign concern, and therefore liable for more than one fee. It has been said, indeed, that these 1000 commission men represent 10,000 houses. If the tax is enforced to the letter of the law it must operate to drive the commission business to Canadian centers outside of Quebec Province.

What with the Dominion Government's regular duties, additional special duties and German surtax, and what with the Quebec tax on commercial travelers and manufacturers' agents offering foreign goods, outsiders will find it difficult to sell goods in the French Province.

A Government Rail Order.

The Minister of Railways and Canals has given an order for 20,000 tons of steel rails to the Dominion Iron & Steel Company. They are to be laid on the Intercolonial line and must be delivered before the close of the current year. If the contracts for a part of the Eastern division of the Grand Trunk Pacific are given out next autumn, as the Commissioners expect, the Dominion Company's mill will be likely to have orders from that quarter as well. The company is now ready, it is understood, to make rails up to the full capacity of its rail plant. It has just completed repairs to its blooming mill engines and has made a test of its rail mill that is reported to have proved its fitness. Skilled hands for the mill have arrived from the United States. A general increase in the wages paid by the company to its laborers has been decided on, the pay of these having been raised from $1.30 and $1.35 to $1.40 per day. Its rod mill has been started up again.

The Grand Trunk Pacific Railway Company will build the branches to the Eastern division as well as the main line of the Western division. It is now about ready to call for tenders to construct the branch from Fort William, at the head of Lake Superior, northward or northwestward to the main line, a distance of 200 miles. That opens a prospect for an order for the rail mill at Sault Ste. Marie.

Notes.

N. W. Rowell, K. C., one of the three of the Government appointed directors of the Lake Superior Corporation, and agent of the Government in connection with the company, has resigned both positions.

The employees of the Bertram Shipyards in Toronto have been paid off. The works were some time ago acquired for the Canadian Shipbuilding Company, whose plans of operating the Bertram yards have not yet been announced. C. A. C. J.

Scale Settlement with Republic Iron & Steel Company.

After a three days' conference in Detroit, Mich., last week between wage committees of the Republic Iron & Steel Company and the Amalgamated Association, a settlement of the puddling and bar iron scales was reached June 9, and the scale was signed by both parties, effective from July 1, 1905, to June 30, 1906. Briefly, the settlement means that the puddlers receive an advance of 2½ per cent., the finishers, who demanded an advance of 13 per cent., get about 5 per cent., and the roughers are increased about 6 per cent. on this year's scales. The full Amalgamated scale, as proposed by the Amalgamated Association, was printed in *The Iron Age* of May 25.

The fact that the Republic Iron & Steel Company was able to effect such a quick settlement of the puddling and bar scales is taken to mean that a reasonably prompt settlement of the sheet and tin plate scales may be reached when the wages committees of the American Sheet & Tin Plate Company and the Amalgamated Association come together in conference. It is expected that the Amalgamated Association will make such concessions in the proposed sheet and tin plate scales as will lead to early adjustment. The independent sheet and tin plate mills will probably be governed by the settlement reached with the American Sheet & Tin Plate Company. As yet no date has been fixed for a conference on the sheet and tin plate scales, but it will likely be held late this week or early next week.

NEWS OF THE WORKS.

Iron and Steel.

The larger bid of the Penn Bridge Company, Beaver Falls, Pa., for the plant of the South Pittsburgh Iron Works, at Claysville, Pa., amounting to $28,310 has been accepted and the sale confirmed by the court. The original bid of this concern for the plant was $18,000, but on application of a Pittsburgh firm the sale was not confirmed and sealed bids were asked by the court, with the result that the Penn Bridge Company increased its original bid to the above amount and secured the plant.

The tin plate plant of the American Sheet & Tin Plate Company, at South Sharon, Pa., containing 20 hot mills, is idle in all departments. The Bray continuous process for the rolling of sheets, which is being installed in this plant, is nearly ready and is expected to be started early in July.

The Jones & Laughlin Steel Company, Pittsburgh, has been steadily making purchases of ground adjacent to its large mills on the South Side in that city, and now owns a great deal of property which is to be utilized for further extensions. At present this company is tearing down about 60 old dwelling houses located on property which it owns in order to make room for removal of the 20-inch beam mill from its present location. This mill is now cramped for room and when removed to the new site some new appliances will be added, which will largely increase its capacity. The removal of this beam mill will provide more room for the other mills and give better facilities for the handling of material.

The W. K. Kenly Company, Chicago, which was incorporated during the latter part of April, has opened a warehouse at 452 to 456 East Illinois street, on the Chicago & Northwestern tracks, in which it is carrying a complete stock of light section T-rails from 8-pound to 45-pound section, splices complete, including bolts and nuts, and railroad spikes of all sizes. The company informs us that the building is equipped with the necessary equipment to saw rails of any weight section to any desired length in light section material as well as in heavy section relayers for building and vault purposes. It is the intention of the company to occupy its present warehouse for one or two years, at the end of that time erecting one of its own. W. K. Kenly is president and A. E. Stephens, for eight years with the Latrobe Steel & Coupler Company, is secretary and treasurer. Offices of the concern are in The Rookery Building, Chicago.

The two blast furnaces, Bessemer plant and blooming mill of the National Tube Company, at Wheeling, W. Va., have been closed down. A metal mixer is being installed in the Bessemer plant and some other repairs are being made, which necessitate the shutdown of that portion of the plant. One of the blast furnaces was blown out for repairs and the other because of the suspension of work at the steel plant. The rolling mills and pipe mills are operating in full and will continue to do so. It is expected that both blast furnaces and the Bessemer plant will resume active operations on or before September 1, by which time it is expected to have the above improvements finished. A water purifying plant is also being installed and direct metal will be used from the blast furnaces in the steel works when the mixer has been installed.

The American Tin Plate Company will spend $50,000 in installing gas producers and an electric crane and building a reservoir at its plant in Gas City, Ind.

At the annual meeting of the Kokomo Steel & Wire Company, Kokomo, Ind., the amount of business done for the year was shown to be nearly $2,250,000. The company is paying 6 per cent. on its stock. The company has greatly increased its wire fence department. The goods go to 27 States. Nine hundred men are employed. A. A. Charles is president; A. V. Conradt, vice-president; J. E. Frederick, secretary; G. W. Charles, treasurer, and Thomas Harris, superintendent.

The Carnahan Tin Plate & Sheet Company, Canton, Ohio, which recently purchased the plant of the Juniata Iron & Steel Company, at Greencastle, Ind., advises us that it is not rebuilding this plant, as reported, but has made a few slight repairs and placed the entire plant in operation. The works contain six sheet and pair furnaces, one annealing furnace, six stands of hot rolls and six stands of cold rolls, the product being sheets and black plate for tinning, and the annual capacity 18,000 net tons. The Carnahan Tin Plate & Sheet Company has changed the name under which the plant will be operated to the Western Tin Plate & Sheet Company.

The work of rebuilding the plant of the Rome Merchant Iron Mill, Rome, N. Y., which was destroyed by fire February 2, is progressing very favorably, and the mill is expected to be in operation by the middle of July.

Victoria Furnace of the Chapman Iron & Coke Company, at Goshen, Va., was blown in on Monday after being idle for four weeks, during which time it was relined. The furnace was blown in on May 31 for 48 hours, but was blown out again for additional repairs. The company is installing a hot blast stove.

modern blowing engines, automatic skip hoist, ore and coke conveyors.

The Central Iron & Steel Company, Harrisburg, Pa., made what is considered a very large tonnage of plates for its plant at Harrisburg, Pa., in May. The total amount of plates turned out was 12,300 tons. The company is operating its entire plant.

The Scottdale Furnace Company, Scottdale, Pa., has been granted a charter by the State of Pennsylvania. It has a capital of $50,000.

General Machinery.

The Standard Pattern & Mfg. Company, Richmond, Ind., has incorporated. The company is designing and building machinery and tools, making patterns, doing drafting, perfecting inventions and doing general repair work. To its present well equipped shop will shortly be added a 26-inch to 32-inch engine lathe and a light friction drill press. The officers of the company are John A. Shutz, president; C. L. Newcomb, vice-president; M. L. Kirkman, secretary and treasurer.

The C. E. Sutton Company, Toledo, Ohio, manufacturer of punches, shears, &c., has just completed the addition of a steel casting department to its plant and is now prepared to supply the demand for steel castings from ¼ pound up to 5 tons, with a capacity of 20 tons daily. The company will operate the Tropenas process.

The C. & C. Electric Company reports having taken a number of orders recently for direct connected motors for driving machine tools. Among others is one from their Pittsburgh office for some 20 motors, nearly all of which are of the variable speed type. Several orders for electric welding outfits are also reported.

The Reading Railroad has awarded contract for the construction of a power house at Port Richmond, Pa., to supply power for operating the machine tools and lighting the shops, which have recently been extensively enlarged.

The Exeter Machine Works, New York, has lately closed the following contracts for complete coal and ash handling plants: Hudson River Electric Power Company, Utica, N. Y.; United Electric Light Company, Springfield, Mass., and Tennessee Copper Company, Copperhill, Tenn. The installations include the Le Grand patent pivoted bucket conveyor, belt conveyors and new design of suspended flight conveyors.

The B. F. Sturtevant Company, Boston, Mass., has recently secured a number of large contracts for heating and ventilating equipment. Among them were two from the Pennsylvania Railroad. One was for the new machine shop at Renovo, Pa., which contains nearly 750,000 cubic feet of space and requires for its heating to 65 degrees in zero weather a large steel plate engine driven fan, with heater, and a system of underground ducts with outlet connections. The other was for the Trenton shops, which include machine and erecting shop, paint shop and planing mill, containing over 4,500,000 cubic feet of space, and requiring a half dozen fans, with the necessary heaters and systems of distributing pipes. Others were the Elgin National Watch Company, Elgin, Ill., for five separate hot blast apparatus, each including a fan, engine and heater, and also two special ventilating systems; Allegheny County Jail, Pittsburgh, Pa., five complete sets of heating and ventilating apparatus; for export to Japan, a complete lumber dry kiln equipment, consisting of a steel plate engine driven fan with direct connected heater and a full outfit of iron work for lumber trucks, T-rails, &c., and for mechanical draft apparatus the following: Dwight Mfg. Company, Chicopee, Mass., 1850 horse-power; Pennsylvania Salt Mfg. Company, Greenwich Point, Pa., battery of boilers and stills; Nashua River Paper Company, East Pepperell, Mass., 1500 horse-power; Paragon Park, Nantasket Beach, Mass., 620 horse-power, and Haverhill Electric Company, Haverhill, Mass., 650 horse-power.

Power Plant Equipment.

The Columbus Street Railway & Light Company, Columbus, Ind., will receive bids in about 30 days for the construction of a new power house and central heating plant. R. F. Gottschalk is president of the company.

The equipment to be installed in the new plant of the Walter M. Lowney Company, in Montreal, Can., will include three small engines with direct current electric generators on shafts, two of 80 kw. and one of 30 kw. There will be two 150 horse-power vertical fire tube boilers and a 40-ton refrigerator plant. The plant is to consist of a brick building 55 x 150 feet, six stories high, with an addition 27 x 100 feet for the boiler, engine and refrigerating plant and a machine shop and coal pocket. Dean & Main, mill engineers and architects, Boston, Mass., are in charge of the engineering features.

The plant of the Horseshoe Mining Company, Deadwood, S. D., which was recently destroyed by fire, is to be rebuilt, but it has not yet been fully determined as to the type of plant which the company will erect. The engines and boilers that will be required will be about 500 horse-power. No purchases of machinery have as yet been made.

The Water Commissioners of White Plains, N. Y., will receive bids until June 19 for one 2,000,000-gallon triple expansion direct acting condensing pumping engine, to be erected in the pumping station.

The Water Commissioners of Harrisburg, Pa., have given annual contracts to R. D. Wood & Co., Philadelphia; Eddy Valve Company, and Rensselaer Mfg. Company, Troy, N. Y., and the W. O. Hickok Company and J. N. Deeter of Harrisburg.

The United Traction Company of Reading, Pa., has decided to build a large power plant at Tulpehocken Creek, near Reading, details to be announced later. The company will also enlarge its Klapperthal plant.

Contracts were awarded June 5 by the State Normal School, J. N. Wilkinson, president, Emporia, Kan., as follows: Engines, Great Western Mfg. Company, Leavenworth, Kan.; boilers, J. C. Jones & Sons, Emporia, Kan.; generator, Bullock Electric Mfg. Company, Kansas City, Mo.

Foundries.

The American Steel Foundries, New York, has received an order from the Atlantic Coast Line for 1000 cast steel body bolsters for 30-ton box cars to be built at the shops of the South Atlantic Car & Mfg. Company, at Waycross, Ga., and 2000 cast steel body bolsters for the same class and capacity cars to be built by the Western Steel Car & Foundry Company at its Anniston plant.

Fires.

The mills of the Granite Linen Company, Wortendyke, N. J., were destroyed by fire last week, involving a loss of about $150,000.

F. A. Potts & Co.'s foundry, at Indianapolis, Ind., was recently damaged $4000 by fire.

The repair shops of the Buffalo, Rochester & Pittsburgh Railroad, at Lincoln Park, N. Y., were recently damaged $20,000 by fire.

The plant of Ford & Donnelly, Kokomo, Ind., was recently damaged $10,000 by fire.

A large fire in the Williamsburgh District, Brooklyn, N. Y., destroyed the five-story brick factory of the New York & Brooklyn Casket Company and damaged Vogel Brothers' tin can factory. The loss to the casket factory is placed at $225,000 and the damage to the tin can factory is estimated at $25,000.

A planing mill owned by the Rufus Deering Company and the Delano Planing Mill Company, Portland, Maine, was burned June 9, with a loss of $13,000 on mill and machinery.

The plant and equipment of the Milwaukee Boiler Company, 220 Oregon street, Milwaukee, Wis., were damaged by fire June 9 to the extent of $4500, fully covered by insurance.

The East Berlin plant of the Peck, Stow & Wilcox Company, Southington, Conn., manufacturer of hardware, was damaged by fire to the extent of $40,000 June 9. The blacksmith, blower, grinding, divider and pickling departments were in the burned buildings.

Bridges and Buildings.

The Pennsylvania State Commission of Public Buildings and Grounds has awarded the contract for the new State bridge at Nescopec, Luzerne County, Pa., to the York Bridge Company, York, Pa., at its bid of $209,500. There were 30 bids received at Harrisburg on Tuesday.

The Maryland Coal Company has ordered a steel frame coal trestle, 272 feet long and 25 feet wide, with steel tipple house 25 x 99 feet, for its mines at Wendel, Taylor County, W. Va. The contract has been placed with Wm. B. Scaife & Sons Company, Pittsburgh, Pa.

The Keystone Structural Company, Philadelphia, has been given the contract for a large bridge to span the new yards of the Reading Railroad at Rutherford, Dauphin County, Pa. The new bridge will carry trolley tracks and a county road.

The stockholders of the Belmont Iron Works, Philadelphia, Pa., will meet this week to act on a proposed increase of the capital stock to $300,000.

The County Council of Allen County, Ind., meeting at Fort Wayne, has appropriated $17,000 for the construction of a bridge over the Maumee River.

The Newcastle Bridge Company, Indianapolis, Ind., has changed its name to the Central States Bridge Company.

On Saturday, June 10, the McClintic-Marshall Construction Company, Pittsburgh, shipped from its works at Rankin, Pa., a solid train of 50 cars loaded with structural steel to be used in erecting a new car shop for the American Car & Foundry Company, at Madison, Ill., which will be 150 x 900 feet, and is expected to be under roof July 10. The train carrying the steel was run through the entire distance as a special, going over the Pittsburgh & Lake Erie & Western connections. The McClintic-Marshall Construction Company expects to have this building completed in a remarkably short period from the time the contract was let.

The Ohio Valley Bridge & Construction Company is a new concern at Indianapolis, Ind., incorporated by Frank K. Sawyer, R. L. Koonts and Charles L. De Hass.

The W. F. Remppis Company will start its works at Reading, Pa., on double turn to handle the large number of orders. The company is making some of the structural work for the new Pennsylvania State Capitol at Harrisburg.

Hardware.

A. R. Way, Intervale, N. H., has organized a company for the manufacture of a new horseshoe. No factory has yet been leased.

Rumor has removed the business of the Trimont Mfg. Company, Boston, Mass., manufacturer of wrenches, to a number of new locations. The company's plant is not large enough for its prospects, and it will be necessary to make a change of some sort. Very likely the business will be taken from Roxbury, and perhaps at no distant day, but up to the present time no decision has been made. A number of locations have been considered by the officials of the company.

The New England Enameling Company, Middletown, Conn., is to erect a brick and iron plant, 40 x 70 feet, replacing the tinning shop recently destroyed by fire.

A company is organizing at Pittsfield, Mass., to manufacture a fusible safety plug, the invention of Charles J. Cole of that place.

The Berbecker & Rowland Company, Waterville, Conn., manufacturer of cabinet and upholstery hardware and metal goods, is to erect a new one-story building, 59 x 247 feet.

Emmelmann Bros. Mfg. Company, Indianapolis, Ind., manufacturer of combination automatic gasoline soldering iron and blow torch, reports business increasing so rapidly that it has been necessary to double the capacity of its plant.

The Cleveland Wire Spring Company, Cleveland, Ohio, has recently made large additions to its factory, and besides its spring, metal hod, box and barrel departments, has added an extensive plant for the manufacture of wire forms of all descriptions and complicated shapes.

The Boston Bolt Company, 284 Franklin street, Boston, Mass., manufacturer of all kinds of bolts and kindred lines, has made extensive improvements in its plant at South Boston. A large amount of new machinery has been installed, increasing the company's capacity about two-thirds. The company will continue to make a feature of special work, as well as to manufacture the regular lines.

The Parker Wire Goods Company, Worcester, Mass., has increased its capital stock from $15,000 to $20,000, which has been made necessary by the growth of the business.

The Menasha Woodenware Company, Menasha, Wis., intends rebuilding its dry kilns, recently destroyed by fire at Ladysmith, Wis.

Miscellaneous.

The Ohio Cultivator Company, Bellevue, Ohio, has purchased the entire business of the Bissell Chilled Plow Works, South Bend, Ind., the transfer taking effect June 1. The entire equipment of the Bissell works will be removed to Bellevue as soon as new buildings can be erected for its installation. Improvements to be made include the erection of a very large foundry, the present foundry being utilized in the future for a grinding and fitting room. A large warehouse will also be erected and a fire proof pattern shop, 50 x 100 feet. The purchase of this plant by the cultivator company consummates a plan long held by it to add chilled plows to its line.

The recent fire at the plant of the Ohio Brass Company, Mansfield, Ohio, interfered in no way with the company's shipping facilities. The buildings which were burned largely contained stock and raw materials. The office buildings, shipping department, &c., were not touched by the fire.

The Carlisle Body & Gear Company, Carlisle, Pa., is rebuilding its plant, which was recently destroyed by fire. The company will put up one of the most modern factories in the country and will equip it with the best machinery, which will be operated by independent motors. A power plant will also be installed to generate electricity.

The Davies Automatic Shear Company, New York, recently incorporated, is fully equipped to manufacture its shears, on which it owns several patents covering shear connections. The company will buy the blades from standard makers and manufacture the connecting devices. Peveril Meigs, Jr., 18 Exchange place, is treasurer.

The Jennings Bros. Mfg. Company, Bridgeport, Conn., manufacturer of clock cases and art metal goods, is to erect a four-story brick addition to its plant, 30 x 100 feet, with a wing 40 x 60 feet.

The Universal Button Fastening & Button Company, Detroit, Mich., has secured a site for a new building 120 x 200 feet. It has not been decided whether steam or electric power will be used.

Frank B. Pope, 707 Diamond Building, Pittsburgh, sales agent for the Pennsylvania Fire Brick Company, has closed a contract with the Carnegie Steel Company for nearly 1,000,000 Beech Creek fire brick, to be used in relining blast furnace "G" at the Edgar Thomson furnace plant of the Carnegie Steel Company at Bessemer, Pa.

The Haring Cotton Picker Company is a new corporation at Dallas, Texas, organized for the purpose of building cotton picking machines. Officers and directors of the company, which is capitalized at $2,000,000, are as follows: P. P. Haring, president and general manager; Lewis M. Dabney, vice-president; Jake Metzler, treasurer, Houston, Texas; W. W. Graham, secretary; Elihu A. Sanger, H. L. Edwards, J. C. Burns, Goliad, Texas; H. J. Haring, Houston, Texas. The company expects to begin the erection of a new plant some time the coming fall.

Vice-Chancellor Pitney, at Newark, N. J., has appointed Elvin W. Crane receiver for the Damascus Process Company, a concern organized to develop a secret process for the manufacture of steel.

The Buzzell Heat & Light Generating Company, Boston, Mass., has been incorporated in Massachusetts to manufacture a gas generating stove or furnace for household use, to heat the house and furnish gas for cooking. The authorized capital stock is $40,000. Philip M. McDonald is the president and Charles A. Buzzell, Newburyport, Mass., is the treasurer. The company is not prepared to make a definite statement as to the location of its shop.

The Union Specialty Mfg. Company has broken ground at Beaver Falls, Pa., for the building of a plant to manufacture blind stitch sewing machines and typewriters. W. A. McCool of Beaver Falls, James L. Sharkey of Chicago and C. E. McKim of Pittsburgh are at the head of this concern and the capital is given at $600,000. The main building, of brick and steel, will be 62 x 337 feet and two stories high.

The Ellis Keystone Agricultural Works, Pottstown, Pa., has filed an increase of capital stock to $100,000.

The Oklahoma City Mill & Elevator Company, Oklahoma City, Okla., is to build an elevator plant, including a steel elevator of 100,000 bushels capacity; a five-story mill building, 48 x 100 feet, with a capacity of 1000 barrels; a two-story warehouse, 100 x 100 feet, and a boiler and engine room. R. C. Stone has been given the contract for the erection of the steel elevator. The elevator will be equipped with the usual machinery, consisting of cleaning, grading and sacking machines, elevators, conveyors, &c. All of the machines and equipment in this elevator will be direct connected with electric motors.

The Middletown Car Works, Middletown, Pa., has taken an order for 500 cars for the Imperial Japanese railways. The order is to be rushed and will comprise cars with latest patents.

The Giant Grip Horse Shoe Company, whose main office is at Minneapolis, Minn., is erecting a new plant at Little Falls, Minn., to which point the present works at Duluth will be removed. The new plant will be electrically operated. Shafting, belting, pulleys and probably a gang drill for drilling holes in steel horseshoes will be purchased, but outside of these items the machinery at the old Duluth plant will be sufficient for present needs. The company manufactures a removable calk horseshoe under the Swanstrum patents.

The Globe Knitting Mills, Rambo & Regan, Incorporated, Norristown, Pa., is preparing to make extensive additions to its plant. The factory addition will be 46 x 64, four stories high, with brick walls, floors of slow burning construction, inclosed brick stairway and tank tower. There will be an addition 24 x 43 feet, one story high, to the boiler room, and a radial stack 128 feet high will be erected. The power house will be enlarged by a one-story addition 17 x 35 feet, with machinery supported by a reinforced concrete floor of the girder frame system. A new 125 horse-power boiler is to be installed, as is also a direct connected dynamo and engine.

The Keasey Wood Split Pulley Company, Toledo, Ohio, which early in the spring suffered a complete loss of its factory by fire, has now become installed in its new plant. This is composed of brick structures. The main building is 81 x 167 feet; machine shop, 75 x 75 feet, and wood shop, 54 x 167 feet, with dry kilns, offices, &c. The capacity has been increased fully 50 per cent., and the company is now in shape to care for all orders promptly.

Mr. Schwab's Operations.

According to the *Register* of Ironton, Ohio, Charles M. Schwab and a number of associated capitalists recently visited that city and inspected the works of the Kelly Nail & Iron Company and Belfont Iron Works, together with the properties at Ashland, Ky., of the Ashland Steel Works, the Norton Iron Company and the Ashland Coal & Iron Company, upon all of which he and his associates are said to have held an option for some months. This report is confirmed from other sources, and the statement is made that Mr. Schwab is acting with John W. Gates in behalf of the Republic Iron & Steel Company, which would thus find an outlet for the large steel tonnage of the Youngstown plant, which in May made 42,000 tons of steel, and to which, according to plans under consideration, a wire rod mill is to be added. The statement is also made that negotiations are pending for the acquisition by the Republic Company of the Pittsburgh Steel Company, which, not having a steel plant, purchases its supply of steel billets largely from the Republic Company.

There is evidence that Mr. Schwab is also actively engaged in developing some plans for a consolidation of some of the Eastern furnaces and steel plants. Two furnace properties and two steel works and structural mills in Pennsylvania and in New Jersey are mentioned, but nothing has been officially stated.

The Iron and Metal Trades

Nothing has occurred during the past week to materially change the attitude of buyers and sellers in the Iron trade as a whole. The larger consumers of raw materials seem to be well covered for some time to come, and the producers show little disposition to force material on an unwilling market, particularly since they have contracts to take care of their output for months. Still the market is in buyers' favor in Pig Iron, and prices are slowly receding. Sentiment, which rules the situation to-day, is swayed by the belief that production is slightly in excess of requirements and that we have a quiet period before us, during which the level must be found at which buyers will take hold with the usual rush.

Pig Iron has receded to $12 for No. 2 Foundry at Birmingham and there are reports of concessions below that figure. Northern Irons have declined correspondingly, but there has been very little business done.

Steel Billets are easier in the leading markets.

In the Steel Rail trade the most interesting fact is the admission that the Republic Company has taken orders for about 20,000 tons and that negotiations for further tonnage are pending. It is reported that the rolling of Rails will begin at the Youngstown mill in July. The event is not one which particularly affects the situation for this year, but it brings up some perplexing problems for the future.

The activity in Structural Material continues. The largest order taken during the week is 6000 tons for the Deep Water System of Virginia. Chicago notes some fair building contracts, and a lot of good work is coming up in nearly all the leading cities.

The Plate mills are active and there is prospect of some additional round lots coming up for additional lake vessels. Car orders, too, are being received by builders, which will keep them busy.

In the lighter lines the settlement effected between the Amalgamated Association and the Republic Company indicates that there is little prospect of labor troubles in the Iron branch.

An interesting contract has come to public notice now between the International Harvester Company and the Interstate Iron & Steel Company in the Chicago district. The Harvester Company will furnish the Steel and take all of the product of Bars and Shapes, marketing any surplus above requirements.

Some significant movements are going on in the Wire trade pointing to a consolidation of some of the interests. The manufacturers are to meet in Chicago next week. Rather more encouraging reports have been heard lately concerning the condition of the trade.

Skelp is weak East and West.

The export trade is being pushed more vigorously. Among the orders placed recently are a lot of 3000 tons of Sheet Bars and some good lots of Girder Rails. The export Wire trade continues to be active.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	June14, 1905.	June7, 1905.	May17, 1905.	June15, 1904.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	*$16.75*	$17.00	$17.25	$14.50
Foundry Pig No. 2, Southern, Cincinnati	*14.75*	14.75	15.75	11.75
Foundry Pig No. 2, Local, Chicago	*16.50*	17.00	17.25	13.25
Bessemer Pig, Pittsburgh	*15.85*	15.85	16.10	12.85
Gray Forge, Pittsburgh	*15.35*	15.50	15.60	12.35
Lake Superior Charcoal, Chicago	*17.00*	17.50	17.50	14.50
BILLETS, RAILS, &c.:				
Steel Billets, Pittsburgh	*22.00*	23.00	23.00	23.00
Steel Forging Billets, Pittsburgh	*25.00*	26.00	26.00	....
Steel Billets, Philadelphia	*26.50*	26.50	27.00	24.00
Steel Billets, Chicago	28.00	28.00	28.00	23.00
Wire Rods, Pittsburgh	*33.00*	34.00	340.0	29.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	*12.00*	12.00	13.00	9.50
O. Steel Rails, Philadelphia	*15.00*	15.00	16.50	11.25
O. Iron Rails, Chicago	*16.50*	17.00	18.50	14.50
O. Iron Rails, Philadelphia	*18.50*	19.00	22.50	14.50
O. Car Wheels, Chicago	*14.25*	14.25	15.00	11.00
O. Car Wheels, Philadelphia	*15.00*	15.00	16.00	11.00
Heavy Steel Scrap, Pittsburgh	*13.75*	14.50	14.50	11.50
Heavy Steel Scrap, Chicago	*11.75*	12.00	12.50	9.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	*1.63½*	1.63½	1.73½	1.48½
Common Iron Bars, Chicago	*1.50*	1.50	1.55	1.30
Common Iron Bars, Pittsburgh	**1.60**	1.60	1.55	1.35
Steel Bars, Tidewater	1.64½	1.64½	1.64½	1.49½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.35
Tank Plates, Tidewater	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater	1.74½	1.74½	1.74½	1.74½
Beams, Pittsburgh	1.60	1.60	1.60	1.60
Angles, Tidewater	1.74½	1.74½	1.74½	1.74½
Angles, Pittsburgh	1.60	1.60	1.60	1.60
Skelp, Grooved Steel, Pittsburgh	1.50	1.50	1.50	1.35
Skelp, Sheared Steel, Pittsburgh	1.55	1.55	1.55	1.35
Sheets, No. 27, Pittsburgh	*2.20*	2.20	2.30	2.05
Barb Wire, f.o.b. Pittsburgh	2.25	2.25	2.25	2.50
Wire Nails, f.o.b. Pittsburgh	1.80	1.80	1.80	1.90
Cut Nails, Mill	1.80	1.80	1.80	1.75
METALS:				
Copper, New York	15.00	15.00	15.00	12.62½
Spelter, St. Louis	*5.10*	5.05	5.30	4.75
Lead, New York	4.50	4.50	4.50	4.20
Lead, St. Louis	4.42½	4.40	4.45	4.10
Tin, New York	**30.25**	29.95	30.00	26.20
Antimony, Hallett, New York	**11.50**	10.25	8.75	7.25
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.74	3.74	3.74	3.64

Chicago.

FISHER BUILDING, June 14, 1905.

The most pronounced change in market conditions since last week's report is the materially lower range of prices on Pig Iron. Just exactly what the prices of Pig Iron are is impossible to state in definite figures, because producers in the same locality differ as to their ideas, some being willing to take business at the bottom of the market on the supposition that prices will go still lower, while others, believing that the present weakness is only temporary, are satisfied to stay out of the market until the expected rally takes place. The price of $12, Birmingham, for No. 2 Foundry and No. 2 Soft Iron has been and is being made. At the same time there are factors in that district holding for $13 and have not yet consented to reduce that price. In the Chicago district $16.50 is about the going price for local Northern Foundry Iron delivered, though there are some furnaces that are willing to take business at $16 at the furnace, which may mean $16.25 to $16.50, delivered f.o.b. team track Chicago. The Pullman Company is in the market for more than 2000 tons of Iron, mostly Foundry quality, and has not yet awarded its contract, as it finds it advantageous to delay closing because many buyers evidence the desire to reduce their former figures. In Finished Iron and Steel the most important announcement is in connection with the relations existing between the International Harvester Company and the Interstate Iron & Steel Company. A conversion contract of considerable importance has been arranged between these two companies covering a large tonnage of Steel Billets

and Blooms which will be furnished by the Harvester Company to the new Steel mill and by that interest manufactured into Steel Bars and Shapes, which will be delivered to the Harvester Company both for its own use and for its selling department, to be added to the line of Bars and Shapes which is already offered to the general trade by the selling department of the Harvester Company, making altogether a most complete range of sizes and shapes on the Steel Bar and Shape card. This arrangement, entered into some time ago but just now made public, led the Interstate Iron & Steel Company to install an additional 12-inch mill at its East Chicago works. This mill is now being erected and will be in operation early in July, with a monthly capacity of about 7500 tons of Bars and Shapes. Just what tonnage is involved in this arrangement is not made public, but from outside sources it is learned that it is probably sufficient to keep the new mill in operation continuously for at least a year. If this is the case it is one of the large deals of the season in this market. The Steel Bar market, which has been wavering for some weeks, has broken under the onslaughts of overloaded jobbers who desire to turn to profitable advantage old contracts made on the 1.30c., Pittsburgh, base before their expiration by limitation July 1, and are making concessions for mill shipments amounting to about $2 a ton, or, in other words, are splitting the difference between their cost and the present official selling price in order to secure immediate specifications. In Structural Steel some contracts of fair moment have been awarded. Structural Steel and Plates in general are very strong. Sheets are weak, with prevailing quotations about $2 a ton under the official quotations. Pipe specifications are improving as jobbers' stocks are being depleted. There is nothing new to report in Rails, Billets, Tubes or Cast Iron Pipe. Old Materials are strong in spots and weak in spots, and would probably have advanced quite noticeably had it not been for the reduction in Pig Iron. Metals show some advances. Coke is unchanged.

Pig Iron.—The markets have broken quite sharply since last report, and they are at the present moment in a position where it is difficult to establish any figure as representing the actual selling prices. Southern furnaces seem to be in the attitude of being willing to make great concessions for immediate shipment from stock piles, and it is on spot Iron of this character that the $12 price which we hear so much about is being quoted, while $12.50 to $13 are the prices quoted on contracts covering the last six months of the year. Northern Irons have also receded in price, and $16.50, Chicago, is now openly made, with some buyers claiming they can secure $16, f.o.b. furnace. Inquiry is increasing, and Pig Iron interests here look for an opening of a vigorous buying movement before many days, as it is known that very large tonnages are required by melters for the second half of the year and that many of them have allowed their stocks to run down to the point where they must enter the market before long. Two thousand tons of Basic bought by a local Wire mill about two weeks ago were placed at $15.90, Chicago, or equivalent to $12.25, Birmingham. The buyer states that purchase was made from Ohio furnaces. One interest here has already booked more than 5000 tons of Iron since last week's report, the tonnage being an aggregate of small orders from 100 to 1000 tons each. Jobbing foundries are experiencing a very comfortable increase in their business, and the prospect is that their melt of Iron will be larger in the second half of the year than it was in the first half. This increased tonnage of Foundry Iron will partially offset the probable decrease of consumption of Iron by Steel works. One of the Iroquois furnaces suffered an accident Sunday, but lost only one heat and is now in full operation. The following quotations fairly represent the market, although, as stated above, conditions are so unsettled that no fixed market price applies to all producers:

Lake Superior Charcoal	$17.00 to $17.50
Northern Coke Foundry, No. 1	17.00
Northern Coke Foundry, No. 2	16.50
Northern Coke Foundry, No. 3	16.00
Northern Scotch, No. 1	17.50
Ohio Strong Softeners, No. 1	17.30
Ohio Strong Softeners, No. 2	16.80
Southern Silvery, 4 to 6 per cent. Silicon	17.15 to 18.15
Southern Coke, No. 1	16.15 to 16.65
Southern Coke, No. 2	15.65 to 16.15
Southern Coke, No. 3	15.15 to 15.65
Southern Coke, No. 4	14.90 to 15.40
Southern Coke, No. 1 Soft	16.15 to 16.65
Southern Coke, No. 2 Soft	15.65 to 16.15
Southern Gray Forge	14.65 to 15.15
Southern Mottled and White	14.65 to 15.15
Malleable Bessemer	16.50
Standard Bessemer	16.80 to 17.05
Jackson Co. and Ky. Silvery, 6 % Silicon	19.80 to 20.30
Jackson Co. and Ky. Silvery, 7 % Silicon	20.30 to 20.80
Jackson Co. and Ky. Silvery, 8 % Silicon	20.80 to 21.30
Jackson Co. and Ky. Silvery, 10 % Silicon	21.80 to 22.30
Alabama Basic	15.90 to 16.15

Billets.—Forging Billets are still offered at from $28 to $30 for car lots and greater, while large tonnages on contract might be secured at a somewhat lower price. Bessemer Rolling Billets are quotable at about $28 and Sheet Bars at from $28 to $28.50.

Rails and Track Supplies.—It now develops that the mills of the Carnegie Company are so well supplied with Rail orders that it has been necessary for that company to divert to another mill a fairly large tonnage of Rails on which prompt shipment was required. This places the United States Steel Corporation in shape where it is, for the present at least, indifferent to additional Rail orders. Light Rails are active, but mills are still able to take good care of their orders. Track Supplies are in good demand and a premium over the official price quoted by the leading producers is offered for reasonably prompt shipment. Prices are as follows: Standard Section Rails, $28 per gross ton at maker's mill in 500-ton lots or greater, plus full freight to destination; Light Section Rails, $24 to $27 per gross ton, according to weight and tonnage; Angle Bars, 1.40c. to 1.50c.; Spikes, 1.75c. to 1.85c., f.o.b. mill, in car lots for delayed shipment and 10c. extra for prompt shipment; Track Bolts, 2.40c. to 2.50c., base, Square Nuts, for delayed shipment and 10c. extra for prompt shipment. An effort is being made to fix the advance for Hexagon Nuts at 15c. instead of 10c. over Square, and it is expected that the new deal will go into effect shortly. Store prices on Track Supplies range from 15c. to 25c. per 100 lbs. above car lot mill prices.

Structural Materials.—A contract for 10,500 tons of Structural Steel for the erection of large additions to the Allis-Chalmers plant at West Allis was divided between the American Bridge Company and Riter-Conley. The bridge company also received orders for 800 tons for the Rothschild Building on State street and about 1500 tons for the new Brevoort Hotel. Orders from the Pullman Company for Car Shapes indicate that it has secured an order for 2000 box cars from the Chicago, Burlington & Quincy road. There is no relief immediately in sight from the scarcity of Structural Steel, because in spite of the phenomenal production of all Structural mills the consumptive demand seems to be growing faster than the mill production. Official prices for delivery from mill, f.o.b. Chicago, in car lots, are as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.76½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.76½c.; Angles, larger than 6 inches on one or both legs, 1.86½c.; Beams, larger than 15 inches, 1.86½c.; Zees, 3 inches and over, 1.76½c.; Tees, 3 inches and over, 1.81½c., in addition to the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. Store prices are firm and advancing. Structural Angles are quoted at from 2.10c. to 2.50c.; Channels and Beams from 2.25c. to 2.50c., with 5-inch I-Beams charged at 3c.

Plates.—Mills are fully occupied, but there is no longer any pretense of charging a premium for prompt shipment from such mills as are able to make quick shipments. Many large users, and small ones, too, for that matter, are covered with contracts far into the fall, some of them to next January at 1.40c. and 1.50c., Pittsburgh, and there is a disposition on the part of some mills to be accommodating in the matter of extending low priced contracts that would otherwise expire by limitation before the tonnages were secured. Prices are unchanged and firm, as follows: Tank quality, ¼-inch and heavier, wider than 14 and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Sheared and Universal Mill Plates, Tank quality, 6¼ to 14 inches, inclusive, 10c. below these prices; Flange quality in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.15c. to 2.25c.; Flange quality, 25c. extra.

Sheets.—The market both for Black and Galvanized Sheets is disturbed locally, and is unsettled generally throughout the West because of surplus tonnages either in stock or contracted for last fall by jobbers at low prices, and because the consuming trade itself is unusually well covered by contracts at figures ranging from $4 to $8 a ton lower than present official figures, and $2 to $6 a ton lower than present actual figures. Independent mills very generally have met the $1 a ton rebate made by the leading producers with a similar reduction. Prices on car lots and larger, f.o.b. Chicago, average about as follows: Blue Annealed, Nos. 9 and 10, 1.86½c.; Box Annealed, Nos. 18 and 20, 2.16½c.; No. 27, 2.36½c.; No. 28, 2.41½c., with the customary differentials between gauges. Store prices are unchanged officially at least, and are based on a minimum of 2.10c. for No. 10 Blue Annealed, 2.55c. for Nos. 18 and 20 Box Annealed, 2.70c. for No. 27 Box Annealed and 2.80c. for No. 28 Box Annealed. Galvanized Sheets are quoted in car lots from mill at about the following prices, some mills asking a little more and some offering at $1 a ton less: No. 10, 2.46½c.; Nos. 17 to 21, 2.81½c.; No. 27, 3.36½c.; No. 28, 3.56½c. Store prices on Galvanized Sheets are as follows: Nos. 10, 12 and 14 are selling at from 3c. to 3.10c., Nos. 22 and 24 at from 3.05c. to 3.15c., No. 27 at from 3.50c. to 3.65c. and No. 28 at from 3.70c. to 3.95c., with intermediate gauges in proportion and with customary differentials for widths and lengths.

Bars.—The Western Steel Car & Foundry Company

has not yet placed its order for Bar Iron. It is thought that while Steel may be used largely, the company has on its books orders for cars which must be supplied with Iron on the Pennsylvania Railroad specifications. The Iron market has rallied considerably from the weakness of the last fortnight, because of the firm stand taken by some makers and because of the better feeling in Scrap; 1.50c., base, Chicago, is the minimum price for large tonnages, while the quotations will range from there up to 1.60c. on mixed lots. The Steel Bar market is demoralized by the attitude of the jobbers, who hold contracts for large tonnages bought at 1.30c., Pittsburgh, and who are making concessions in order to secure sufficient mill orders to absorb surplus tonnage before expiration of contracts July 1. Some mills are seeking to make unnecessary this measure on the part of jobbers by extending their contracts. The price of 1.50c., Pittsburgh, or 1.66½c., Chicago, for Steel Bars is only nominal at the present time and has not been the general market price for some weeks. It is thought by Bar mills that surplus tonnages will soon be absorbed, and when that time comes prices will rally to the official figures. Independent Hoop manufacturers are securing more than their share of the Western Hoop trade, as they opened their books some weeks in advance of the leading producer for contracts for the second half of the year, and skimmed the cream off the trade before their larger rival entered the field. It is thought that this action will prevent the contemplated advance in the price of Hoops noted in this report some weeks ago. Official prices on Steel are unchanged as follows: Steel Bars at 1.66½c., base, half extras. Hoops are still quoted at 1.81½c., full extras, Chicago. Soft Steel Angles and Shapes, 1.76½c., half extras, and Hard Steel Angles and Bars at about 10c. below the price for Soft Steel. In store prices Steel Bars and Bands are being held at a minimum of 1.85c., base, half extras; Steel Angles and Shapes, 1.95c., half extras, and Soft Steel Hoops, 2.20c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

Merchant Steel.—Specifications are coming in fairly well on many lines and new contracts are being executed, although there is still the attitude of waiting on the part of many buyers. Current prices are as follows: Smooth Finished Machinery Steel, 1.91½c.; Smooth Finished Tire, 1.86½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Calk Steel, 2.23½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c.; special Grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount in car lots and 45 per cent. in less than car lots in base territory.

Merchant Pipe.—Conditions are unchanged, with the leading producer adhering to his 76 per cent., Pittsburgh, schedule, and independent producers quoting 78 per cent. Large jobbers and consumers, of course, are quoted better prices than these on contracts. Official discounts for car lots to consumers, which must be read in the light of the explanation given above, are as follows: Black Steel, 73.35; Galvanized Steel, 63.35; Black Iron, 71.85; Galvanized Iron, 61.85, with the customary differentials for larger and smaller diameters and for X and XX strong.

Boiler Tubes.—Immediate supply is still inadequate to meet the demand and mill shipments are from four to eight weeks in arrears. The following discounts on car lots, from mill at Chicago, prevail: Base sizes, ¾ to 5 inches, Steel Tubes, 60.35; Iron, 49.35; Seamless Steel, 50.85. Larger and smaller diameters take the usual extras in price, and less than car lots are quoted at two points less discount. We quote from store:

	Steel.	Iron.	Seamless.
1 to 1½ inches	40	35	42½
1¾ to 2¼ inches	50	35	35
2½ inches	52½	35	30
2¾ to 5 inches	60	47½	42½
6 inches and larger	50	35	..

Cast Iron Pipe.—Prices rule weaker, owing to the softness in Pig Iron, but are officially unchanged at $29 a net ton for 4-inch Pipe and $28 for 6-inch and larger, with $1 a ton higher for Gas Pipe.

Old Materials.—Old Materials started to advance, and it is quite probable that higher prices would rule at the present time had it not been for the unexpected drop in Pig Iron which has had an unfavorable influence on the Scrap market. Bids submitted to railroads for materials present a larger than usual variation between low and high prices, the high bidders being both dealers and consumers. The market is in an unsettled condition and prices are hard to establish, though the following figures represent on an average the range of prices which are quoted to large consumers in large tonnages both by producers and dealers:

Old Iron Rails	$16.50 to $17.00
Old Steel Rails, 4 feet and over	12.75 to 13.25
Old Steel Rails, less than 4 feet	12.00 to 12.50
Heavy Relaying Rails, subject to inspection	22.25 to 22.75
Heavy Relaying Rails, for side tracks	19.50 to 20.00
Old Car Wheels	14.25 to 14.75
Heavy Melting Steel Scrap	11.75 to 12.25
Frogs, Switches and Guards	12.00 to 12.50
Mixed Steel	10.00 to 10.50

The following quotations are per net ton:

Iron Fish Plates	$14.75 to $15.00
Iron Car Axles	19.50 to 20.00
Steel Car Axles	15.50 to 16.00
No. 1 Railroad Wrought	13.50 to 14.00
No. 2 Railroad Wrought	12.50 to 13.00
Shafting	15.00 to 15.50
No. 1 Dealers' Forge	10.00 to 10.50
Wrought Pipes and Flues	9.25 to 9.75
No. 1 Cut Busheling	9.00 to 9.50
Iron Axle Turnings	9.25 to 9.75
Soft Steel Axle Turnings	9.25 to 9.75
Machine Shop Turnings	9.25 to 9.50
Cast Borings	7.25 to 7.75
Mixed Borings, &c.	7.25 to 7.75
No. 1 Mill	8.75 to 9.25
Country Sheet	7.00 to 7.50
No. 1 Boilers, cut to Sheets and Rings	9.25 to 9.75
No. 1 Cast Scrap	12.50 to 13.00
Stove Plate and Light Cast Scrap	8.50 to 9.00
Railroad Malleable	11.75 to 12.25
Agricultural Malleable	11.25 to 11.75

Metals.—Tin and Spelter are both higher, and the general tone of the market is fairly strong. We quote Pig Tin 31½c. to 32c. in car lots and 32c. to 32½c. in small lots. Spelter, 5¼c. for car lots and 5½c. to 5⅝c. for small lots. Casting Copper is 14⅞c. to 15c.; Lake, 15c. to 15⅛c. in car lots, with ¼c. to ½c. higher for small lots. Lead is quoted in 50-ton lots at 4.55c., in car lots at 4.60c., and 5c. to 5.25c. in small lots. The new Sheet Zinc schedule is based on $7, La Salle, for car lots of 600-lb. casks. Car lots, Chicago, are sold on the basis of $6.75, with small lots selling at from $7 to $7.50 per 100 lbs. Prices of Old Copper and Brass are as follows: Copper Wire, 13¼c.; Heavy, 13c.; Copper Bottoms, 12c.; Copper Clips, 12¾c.; Red Brass, 11¾c.; Red Brass Borings, 9¾c.; Yellow Brass, Heavy, 8½c.; Yellow Brass Borings, 7⅞c.; Light Brass, 7c.; Lead Pipe, 4¼c.; Tea Lead, 3.85c.; Zinc, 4c.; Pewter, No. 1, 19¼c.; Block Tin Pipe, 25c.

Coke.—Connellsville 72-hour Foundry Coke is unchanged at from $2.25 to $2.50, at the ovens, or $4.90 to $5.15, Chicago. Connellsville Furnace Coke and Foundry Cokes, from less favored discounts, range from 25c. to 50c. lower than these prices.

Philadelphia.

FORREST BUILDING, June 13, 1905.

Without anything unfavorable in the general situation, the Iron and Steel markets have shown little prospect of any early recovery of activity. The monthly furnace report confirmed the impression that the supply of Pig Iron was of great magnitude, and while it also evidenced a large consumption there was nothing in it to encourage purchases for forward delivery. A decrease in production is confidently expected during the current month, but the usual decrease in consumption is also expected during July, so that there will be a fairly good "stand off" between the two, leaving the ultimate outcome contingent upon matters which are as yet undetermined. But leaving out the question of proportion, it is extremely probable that the volume of business during the next six months will be larger than ever before. There is no apparent reason for expecting anything less than that during the first half of the year, and if there are no unfavorable developments during the next few weeks it should be somewhat larger. Some work which will require unprecedentedly large tonnages of Iron and Steel will be well under way within the next month or two, and when the crops are fully assured other work which has been held in partial abeyance may come forward with a rush. Some loss of tonnage appears to be imminent at the Rail mills, and while the output will still be considerable, the loss of 500,000 tons or more in this department will require a good deal of business from other sources to make a full offset to it. The Pipe trade is also somewhat of a laggard, so that the situation is not without some soft spots. Building operations (including general work), besides that of the railroads, are, however, on a very large scale, and the same may be said as regards bridge and car and locomotive building. The shipyards will also be very large consumers during the remainder of the year, while in nearly all lines pertaining to engineering, Boiler work, Tank work, &c., the situation is very encouraging. This is a critical period, however, more so this year than is usual; but while adverse influences are not impossible, the chances appear to favor improvement, and under conditions which are by no means improbable there may be an extraordinary development of business within the next two or three months.

Pig Iron.—Nothing very favorable can be said in regard to this interest, but, on the other hand, there is nothing that can be regarded as seriously discouraging. Buyers still take a pessimistic view of things, but time is favoring sellers a great deal more than it usually does when there is a falling market. A representative house, for instance, went over its books to compare its sales with its shipments during last month and found that the latter were eight times larger than the former, from which it is obvious that on that basis consumers are not replacing their orders in any due proportion to what they are consuming. Of course it may be said that they may not need as much iron, but the fact that they

are now taking so much into their yards is pretty clear evidence that they are using it and that new purchases will be imperative sooner or later, and if delayed too long it will not be a buyers', but a sellers', market, which is an entirely different matter. That point has not been reached yet, however, and may not be in the immediate future, but past experience leads to the conviction that it will be merely a question of time. The demand may be stimulated or retarded according as developments may be from day to day, but it is the general opinion that within a month or six weeks the outlook will have become pretty well cleared. At the present time the market may be defined as extremely dull, and in some cases there are evidences of considerable weakness. This applies more particularly to Mill Irons and to low grade Irons, although Foundry Irons have in some cases shaded off considerably. All depends on circumstances, however. Furnaces that have Iron for prompt shipment are inclined to meet the market, but of these there are not many. Others are a little disposed to discount futures to first class buyers, but as a rule sellers hold to $17 to $17.25 for No. 2 X Foundry for such small lots as buyers need for prompt shipment and have not yet made up their minds to offer inducements for increased tonnages at less money, although business has been done at materially less than $17 for a round lot. The market therefore is in a condition of uncertainty, with little or no demand for special Irons or for low grade Irons, asking prices for Philadelphia and nearby deliveries being about as follows:

No. 1 X Foundry	$17.50 to $18.00
No. 2 X Foundry	16.75 to 17.25
No. 2 Plain	16.00 to 16.50
No. 3 Foundry	15.25 to 15.50
No. 4 Foundry	14.75 to 15.00
Standard Gray Forge	15.25 to 15.50
Basic, nominal	16.00 to 16.25
Low Phosphorus	20.50 to 21.00

Plates.—There is nothing out of the usual run of business, which, however, is quite satisfactory. Mills have plenty of work on their books and therefore expect to run full all through the summer months. Prices are unchanged, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel, over 14 inches wide	1.73½	1.78½
Tank, Bridge and Boat Steel, rectangular plates, 14 inches wide and under	1.63½	1.68½
Flange or Boiler Steel	1.83½	1.88½
Marine, A. B. M. A. and Commercial Fire Box Steel	1.93½	1.98½
Still Bottom Steel	2.03½	2.08½
Locomotive Fire Box Steel	2.23½	2.28½

The above are base prices for ¼-inch and heavier. The following extras apply:

	Per 100 pounds extra.
3-16-inch thick	$0.10
Nos. 7 and 8, B. W. G.	.15 "
No. 9, B. W. G.	.25 "
Plates over 100 to 110 inches	.05 "
Plates over 110 to 115 inches	.10 "
Plates over 115 to 120 inches	.15 "
Plates over 120 to 125 inches	.25 "
Plates over 125 to 130 inches	.50 "
Plates over 130 inches	1.00 "

Sheets.—Fair demand, but prices are a shade easier, as follows: 18 to 20 gauge, 2.30c.; 22 to 24 gauge, 2.40c.; 25 and 26 gauge, 2.50c.; 27 gauge, 2.60c., and 28 gauge, 2.70c.

Structural Material.—Without any new work of special magnitude, the mills are making important additions to their order books. The miscellaneous demand is very good and while the orders are not large individually, the aggregate tonnage is probably as large as during the boom times in 1902. There is no particular rush, but shipments are required at the earliest possible moment, showing that the material is wanted for work actually in progress. Prices are steady and unchanged, as follows: Beams, Channels and Angles, 1.73½c. to 1.85c., according to specifications, and small Angles, 1.65c. to 1.68c.

Bars.—Business is not as active as it was some time ago, although some of the mills are running pretty well up to their full capacity. There is evidently a falling off in new business, however, which is indicated by the lower prices which are said to be quoted. In most cases the Best Refined Bar Iron is held firm at 1.63½c., but buyers claim that they can do better, but whether it is at the expense of quality or not is uncertain. The decline in raw material helps manufacturers a little; so that in some cases it is not unlikely that Bars may be shaded a trifle. Steel Bars steady on a parity with Refined Bar Iron. Skelp is absolutely neglected, with no demand whatever.

Old Material.—The situation has not improved and holders are becoming very tired when they find so little disposition to buy. There may be a better demand during the coming month, but for the present the feeling among buyers is one of complete indifference. The following quotations for bids and offers are as near to the market as can be given, but the outside figures are merely what holders ask as a starting point for negotiations:

Scrap Rails	$15.00 to $15.25
No. 1 Steel Scrap	14.25 to 14.50
Old Steel Axles	17.50 to 18.00
Old Iron Axles	22.00 to 23.00
Old Iron Rails	18.50 to 19.50
Old Car Wheels	15.00 to 15.50
Choice Scrap, R. R. No. 1 Wrought	15.50 to 16.00
No. 1 Yard Scrap	14.50 to 15.00
Long and Short	13.00 to 14.00
Machinery Scrap	14.00 to 14.50
Wrought Iron Pipe	12.00 to 12.50
No. 1 Forge Fire Scrap	12.00 to 12.50
No. 2 Light Ordinary	10.00 to 11.00
Wrought Turnings	12.00 to 13.00
Axle Turnings, Choice Heavy	13.50 to 14.00
Cast Borings	8.00 to 8.50
Stove Plates	9.00 to 10.00

Herbert H. Ives and Allen R. Hoffer announce that they have formed a partnership under the name of the Ives & Hoffer Company for the purpose of dealing in Iron and Steel products, both old and new. Mr. Ives formerly represented the E. Buxton & Son Company, Worcester, Mass., in the Pennsylvania market, and since January 1 has been trading in his own name. The new company will succeed Herbert H. Ives, and has its offices in No. 916-917 Pennsylvania Building. Mr. Hoffer has been the manager of the Philadelphia office of the Wm. H. Perry Company, Providence, R. I., for the past five years.

Cleveland.

CLEVELAND, OHIO, June 14, 1905.

Iron Ore.—The most interesting feature of the Ore trade at the present time is the extremely rapid handling of the material over the Lake Erie docks. Delays of more than a day are very unusual. The big 8000 to 10,000 ton boats are coming into port in the morning and leaving for up the lakes the following morning, having discharged their cargoes. Such records are new on the lakes. Since the appearance of the big boats the docks have either been congested with Ore or there has been a shortage of track space and cars with which to handle it. This year the railroads have readjusted their yard space adjacent to the docks, some improvements have been made in the dock machinery for the handling of the commodity, and the railroads seem to have an abundance of equipment. All of these things have worked in favor of a record movement of the material. At the present pace the shipments for the year ought to come up to or exceed 30,000,000 tons, which is the figure set. The rates of carriage have remained steady at 75c. from the head of the lakes, 70c. from Marquette and 60c. from Escanaba.

Pig Iron.—The demand for Malleable, Bessemer and Basic has considerably increased during the past week or ten days. One good block of Malleable was sold and other inquiries are in for material running through the remainder of the year. The same is true of Basic, where the inquiry has been quite heavy. The independent concerns have been buying Bessemer, but the Steel Corporation has not come into the market. Prices of all three grades run about $15 in the Valleys. There is a very light demand for Foundry Iron. Reports have been made that some has been sold at $15 in the Valley for No. 2, but on the reports being traced it appears in most instances that it was not up to the standard, being off Iron is some particular. It cannot be found that any Iron has sold for less than $15.50 where the Iron has been of standard quality. The Coke market continues easy, with the demand fairly good, but with indications of overproduction. Prices continue to be $2.50 to $2.75 for 72-hour Foundry at the oven and $2 to $2.25 at the oven for Furnace Coke.

Finished Iron and Steel.—There has been a better feeling all through the Steel market in this territory. It has not grown out of any additions to tonnage, seeming to be more of a mental change than anything else. The spirit of the market nevertheless indicates a recovery along several lines. There is talk of anticipating next year's first-quarter needs. For one thing, there is a better tone to the Sheet market. The prices have not advanced, but the bookings have been heavier and some of the smaller mills are showing an inclination to recede from the policy of price cutting to get business. The larger mills are getting consequently a better run of orders. Business out of stock has continued brisk, seeming to increase somewhat. Base quotations out of stock are 2.15c. for No. 10 Blue Annealed, 2.65c. for No. 28 One Pass Cold Rolled and 3.65c. for No. 28 Galvanized Sheets. Jobbers report that the demand for Structural out of stock has been such as to reduce their stocks materially, shipments being heavier than the receipts from the mills. A number of good inquiries have also been received by the mills and, although no big tonnage has been added to the books during the week, the outlook is unusually strong. The shipbuilding people are still taking orders for new ships. The indications are that the tonnage yet to be placed with the lake yards will be fully 50 per cent. of that which has been placed heretofore. No Steel buying has been reported from that quarter recently, but some new orders will come before long. The Bar Iron market has been stronger. This is due in part to the fact that productive capacity will be curtailed about July 1 by the closing of a number of mills for repairs. Some had been sold as low as 1.45c. at the mills, but at present the bottom price seems to be about 1.50c. There has also been a little better buying of Bar Steel. The agricultural imple-

ment works have not started buying as yet, but some of them indicate that inquiries will be sent in within a week or ten days. The situation in that respect seems to be stronger. The price holds at 1.50c., Pittsburgh, for both Bessemer and Open Hearth. The Billet market, which had been dull, has strengthened, with the result that Bessemer 4 x 4 Billets are selling now on the old basis of $26 to $27, Pittsburgh, with a strong demand for the Forging quality.

Old Material.—The market has been quiet. Buyers are still seeking lower prices, but dealers have about come to the conclusion to hold off until after July 1 before attempting to force any material on the market, there being a concerted action in that direction. Prices hold steady as follows, all gross tons: Old Steel Rails, $13.50 to $14.50; Old Iron Rails, $20 to $21; Old Car Wheels, $14 to $14.50; Heavy Melting Steel, $13.50 to $14. All net tons: Cast Borings, $6.50 to $7; No. 1 Railroad Wrought, $14 to $14.50; No. 1 Busheling, $12 to $12.50; Iron Car Axles, $21 to $22; No. 1 Cast, $12.50; Stove Plate, $8.50 to $9; Iron and Steel Turnings and Drillings, $9 to $10.

Cincinnati.

FIFTH AND MAIN STS., June 14, 1905.—(*By Telegraph.*)

Pig Iron.—The time is hardly yet ripe for the long looked for buying movement, and little change is to be noted over conditions existing a week since. This anticipated activity will no doubt be heralded by a heavy line of inquiries, and everything indicates that the forces are silently massing and that sooner or later they will be heard from. While the situation continues inactive and sluggish, a slight development in inquiries is apparent and a better feeling prevails. A canvass of the situation by those who are in a position to judge reveals the fact that a large percentage of consumers must surely do some buying in a very short time. There can be no doubt but that a number in this list have already used what was anticipated would be a six months' supply, and are now buying here and there just sufficient to cover them for perhaps a month at a time. This will probably continue until such time as may be determined that prices are firmly established and have reached a minimum figure. Southern No. 2 is now openly quoted on a $12, Birmingham, basis, which is probably the maximum, and while we make no change in our tabulated schedule from that of last week, we have abundant proof that $11.75 has been made. Just what prices would develop should there be an inquiry for a heavy tonnage we are unable to predict, but from advices received it is safe to say that this latter figure would not present the minimum as it probably does at this writing. Northern No. 2 is a shade lower than our last report and has been sold during the week at a price of $14.75 at the furnace. There is an inquiry from a Southern Ohio Steel plant for 2000 tons of Standard Basic, one for 500 tons Southern delivery to be made during the last five months, and 300 tons Southern for last four months delivery, both from Indiana concerns. We have record of one sale of 200 tons of Southern Iron at $12, Birmingham, basis, that went into Cleveland territory and a sale of 150 tons of Southern and the same of Northern to a southern Ohio smelter on a basis of $11.75 for Southern and $14.70 at furnace for Northern. Freight rates from Hanging Rock district to Cincinnati, $1.15, and from Birmingham, $2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$15.25
Southern Coke, No. 2	14.75
Southern Coke, No. 3	14.25
Southern Coke, No. 4	13.75
Southern Coke, No. 1 Soft	15.25
Southern Coke, No. 2 Soft	14.75
Southern Coke, Gray Forge	13.75
Southern Coke, Mottled	13.25
Ohio Silvery, No. 1	$19.65 to 20.00
Lake Superior Coke, No. 1	16.75 to 17.00
Lake Superior Coke, No. 2	16.40 to 16.65
Lake Superior Coke, No. 3	15.90 to 16.15
Car Wheel and Malleable Irons.	
Standard Southern Car Wheel	$18.25 to $18.50
Lake Superior Car Wheel and Malleable	18.00 to 18.50

Coke.—The market is weak and no special movement is evident. A number of contracts are reported to have been made on a sliding scale basis, extending over the last half of the year. Prices are about the same as last week, the best grades of Connellsville Foundry selling from $2.25 to $2.50, f.o.b. ovens.

Plates and Bars.—There is little less activity to be reported and matters have assumed a more quiet state—that is to say, that while some weeks since a crowded condition prevailed, trade is now flowing in easy channels. There are no changes in prices as yet, but all indications point in that direction in the near future. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same in small lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.73c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.83c., in carload lots.

Old Material.—No change is reported over last week's condition and dealers advise that a state of almost stagnation prevails. Prices, as far as we can learn, are unchanged. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, $14 to $15 per net ton; No. 1 Cast Scrap, $11 to $11.50 per net ton; Iron Rails, $17 per gross ton; Steel Rails, rolling mill lengths, $12.50 per gross ton; Relaying Rails, 56-lb. and upward, $22 per gross ton; Iron Axles, $18.50 to $19 per net ton; Car Wheels, $15 to $16 per gross ton; Heavy Melting Scrap, $12 per gross ton; Low Phosphorus Scrap, $15 to $15.50 per gross ton.

Birmingham.

BIRMINGHAM, ALA., June 12, 1905.

Last week's letter reported an increased demand and more activity in the market than has prevailed for several weeks. Buyers were coming in in increased numbers, and during the past week it was plainly evident that more interest in the market was being manifested. The inquiries were larger in volume and greater in number. There were some inquiries for round lots and *prima facie* evidence is strong to the effect that more Iron was sold than was reported. In the amount sold were some lots that ran into the thousands of tons, but there seems to be a disposition to withhold particulars of sales, especially if they are of any magnitude.

There was one sale during the week to a large and important Western interest for third-quarter delivery of 5000 tons, but the seller refuses positively to impart any of the particulars. It is given out that the sale was on the basis of $12.50 for No. 2 Foundry, but there are others, who are pretty well posted, who declare it was made on the basis of $12 for No. 2 Foundry. The seller has resisted all blandishments in efforts to ascertain the price. There was competition for the order and it could have been worked at $12; and with some there is a strong belief that less than $12 was obtained.

Prices have not been uniform, for there were some sellers who had become restive under the continuous piling up of Iron and entered the market to accept current bids. These sales are labeled, so far as the news gleaner is concerned, with the mystic "private terms" and carefully put away. There was a sale reported of two lots of 500 tons each on the basis of $12.50 for No. 2 Foundry and a sale of 200 tons at $12.25, both lots covering the third quarter. There were a few sales of analysis Iron at the usual difference. As evidence of the prices current for such sales, $13 was obtained for No. 2 Soft, special analysis.

The market is still noted for the persistency with which buyers call for their deliveries not yet due, and it is yet noted that these buyers are not replacing the Iron they are taking. It is also noted that the increase in the number of buyers in the last week or so comes from the ranks of the foundry interests. It is not intended to convey the idea that the market has all at once sprung into an active state, but it is a fact indisputable that there has been a material improvement in the demand, but with no advance in values. Values have rather declined. A continuous demand would without question elevate values.

Stocks here have materially increased, but it would be a very difficult matter to get at just what there is in furnace yards. Some guess it at over 150,000 tons, but it is simply a guess. It cannot be any less, for one interest is credited with carrying over half of this amount and it does not seem to cause any worry.

If we had a few more furnaces like the one lately built at Ensley stock would pile up pretty fast. The record of No. 6 furnace there for one day last week was 380 tons.

Bar Iron is quoted as dull, but prices are unchanged.

In Coke and Coal there is no change to note, except that Coal is rather quiet, with run of the mines quoted at $1 to $1.25. The principal handlers of Coke quote it as firm, with $3.75 as the obtainable price for desirable make, and possibly $3.50 for the output of some ovens. The demand is very fair, because of the reasons stated in last letter.

Some addition to the number of Coal miners is being made by importation from Pennsylvania. The Tennessee Company brought in a car yesterday of 75 miners and their families, and will bring more in as they can provide accommodations for them. The company will stick to its determination to run only open mines.

The Scrap Iron market has been irregular the past week, and there have been some soft places in it. Quotations are as follows:

Stove Plate	$8.50 to $9.00
Heavy Cast Steel	10.50 to 11.00
Old Iron Rails	18.00
Old Steel Rails	12.00 to 13.00
Open Hearth Steel Scrap	13.00
Iron Car Axles	16.00
Steel Car Axles	13.00 to 14.00
Old Car Wheels	14.00 to 15.00
Relay Rails, light	22.00 to 22.50
Relays, heavy	24.00 to 24.50
Railroad Wrought	15.00 to 16.00

The ownership of the celebrated Montevallo Coal mines changed hands the past week, one of the Aldriches buying out the interest of the other, thus keeping the ownership in the family that has controlled them so long.

The report of the secretary of the Commercial Club gives some very interesting data concerning the district, and also a kaleidoscope view of affairs just as they are. During the last 12 months there were 145 charters granted, whose capitalization varied from $2000 to $100,000, and their total being $5,871,000. The total number of houses erected was over 3000. The increase in the capital stock of existing corporations was $2,562,000. In extraordinary improvements, such as the opening of new mines and their equipment, the erection of Coke ovens, opening up of new quarries and other items not chargeable to expense account, the sum of $5,347,220 was spent. There was invested in new buildings nearly $2,500,000, and $1,500,000 was spent in extension of road improvements. The grand total of all the varied investments amounted to nearly $20,000,000. The tonnage of the railroads for the year was over 40,000,000 tons. Taxes were assessed on $51,000,000 of property, and the taxpayers got off cheap at that valuation.

We note that the Standard Oil Company will make this city one of its principal depots and distributing centers, and will soon begin the work of necessary enlargement of the plant here to care for the increased business that its advent will bring to the district.

Pittsburgh.

PARK BUILDING, June 14, 1905.—(*By Telegraph.*)

Pig Iron.—There is some inquiry for Bessemer and Bessemer Malleable Iron, but so far very little actual tonnage has been placed, the ideas of buyers and sellers as to prices being very far apart. Some consumers of Pig Iron apparently have the idea that prices are very much demoralized, when such is not the case. It is true that practically no Pig Iron has been sold for a month, but prices are fairly strong and have not declined to any great extent. The nominal price of Bessemer and Basic Iron is $15, Valley furnace, but at the same time it is true that on large tonnage and for prompt delivery it is probable a lower price would be made. Some small lots of Northern No. 2 Foundry are being sold on the basis of about $15, Valley, but there are no large inquiries. Forge is neglected and is nominally $14.50, Valley, or $15.35, Pittsburgh.

Steel.—The market is quiet, consumers holding off placing orders on account of the prospective shutdown of a number of Sheet and Tin Plate mills about July 1 for inventory and repairs and adjustment of the wage scale. Prices of Billets and Bars are easier and we quote Bessemer and Open Hearth Billets at $22, and Sheet and Tin Bars, random lengths, $24, maker's mill. On contracts for Billets and Bars for delivery over the balance of this year there is no doubt that some sellers would shade above prices.

Iron and Steel Scrap.—We note a sale of 1000 tons of Heavy Melting stock for June and July delivery at $14.50, delivered, carrying a freight rate of 95c. per ton.

(*By Mail.*)

The monthly Blast Furnace report issued by J. G. Butler, Jr., of the Bessemer Pig Iron Association shows that 92 per cent. of the blast furnaces using Lake Superior Ores were in operation June 1. The Republic Iron & Steel Company, the Cambria Steel Company and the Pennsylvania Steel Company had all of their blast furnaces active on June 1, the United States Steel Corporation 95 per cent. and the Bessemer Pig Iron Association 90 per cent.

The week under review has been without any special features, and the quietness which prevailed all through the month of May in the Iron trade not only continues, but seems to be more pronounced than at any time since it started. It is simply a waiting game between sellers and consumers and it is useless to try to sell material at the present time, as consumers are pretty well filled up either with stocks on hand or by contracts placed some time ago, and are not buying. Indications do not point to any higher prices, but, on the contrary, the whole market is weak, excepting Plates and Structural Steel, and there is no incentive to contract ahead. It looks as though the present quietness would continue through this month and possibly through July, but with general conditions good it is reasoned that it is only a matter of time until the Iron trade starts up again. Consumption is going on at a heavy rate, and the longer the demand holds off the larger will be the business when it starts to come to the mills.

There has been some little inquiry for Bessemer and Malleable Bessemer Pig Iron and also for Foundry, but so far the amount of actual tonnage bought is very small. Some consumers of Bessemer and Foundry are feeling the market for third quarter and last half and as a rule are quoted $15, Valley furnace, for both Bessemer and Basic. Northern No. 2 Foundry is quoted at $15, Valley furnace, while some sellers ask $15.50 for small lots. Forge Iron is absolutely neglected.

The Bessemer plant of the Carnegie Steel Company at New Castle, Pa., has been shut down in all departments, caused by the breaking of the blooming mill engine, while the Bessemer plant of the National Tube Company at Wheeling, W. Va., is also closed. The direct metal process is to be installed in the latter plant, and it will be idle for several months. Very little tonnage in Billets and Bars is being sold and prices are easier. Bessemer and Open Hearth Billets are about $22 and Sheet and Tin Bars $24, maker's mill.

New tonnage in Finished Material is quiet, but the mills are running steadily on contracts, on which buyers are specifying quite freely. The settlement of the Amalgamated scale with the Republic Iron & Steel Company goes far to remove any probability of labor troubles this year, as it is believed a settlement of the Sheet and Tin Plate scales will be made without much trouble. It is understood that the Amalgamated Association will make material concessions in its demands and the adoption of the 1904-05 scale for the year beginning July 1 would not be a surprise.

Ferromanganese.—No domestic is being offered, and we quote 80 per cent. foreign Ferro at $49 to $49.50, delivered, for carload lots.

Rods.—The market is very dull and prices are easier, owing to the decline in Steel Billets. We quote Bessemer and Open Hearth Rods at $33 and Chain Rods, $34, maker's mill. These prices would be shaded on a firm offer.

Steel Rails.—This market is very quiet and no large contracts have been placed for several weeks. The Edgar Thomson mills is said to have orders ahead to September 1. We quote Standard Sections at $28 and Light Rails, $23 to $26, depending on weight.

Skelp.—The market is very dull and prices are weak. We quote Bessemer Grooved Skelp at 1.50c. to 1.55c. and Open Hearth, 1.55c. to 1.60c., with $1 advance for Sheared. Grooved Iron Skelp is about 1.60c., and Sheared, 1.67½c. to 1.70c., maker's mill.

Plates.—All the Plate mills are running to full capacity and have work ahead for three or four months. This condition promises to last through the summer, as all the Steel car factories are crowded with orders that will take an enormous tonnage of Plates for a long time ahead. The market is strong and we quote: Tank Plates, ¼ inch thick, 6¼ to 14 inches wide, 1.50c., base; over 14 inches wide and up to 100 inches in width, 1.60c., base, at mill, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edges	$0.10
Gauges No. 7 and No. 8	.15
Gauge No. 9	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
Marine, "A. B. M. A.," and ordinary Fire Box Steel Plates	.20
Still Bottom Steel	.30
Locomotive Fire Box Steel	.50

Shell Grade of Steel is abandoned.

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.40c. f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Structural Material.—No large contracts have recently been placed in this district, but there is a good deal of inquiry and the outlook for the Structural trade is very bright. There is still delay in getting deliveries from the mills, especially for Open Hearth stock. Several very large contracts in the East are about ready to place and tonnage for June is expected to be fully as large as in May. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.60c.; Angles, 8 x 8 and 7 x 3½ inches, 1.70c.; Zees, 3-inch and

larger, 1.60c.; Tees, 3-inch and larger, 1.65c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—The demand is very dull and some of the Sheet mills have partially closed down, while others are getting ready to do so. It is said that stocks of Sheets held by jobbers are still very heavy, and as these were bought when prices were $3 to $4 a ton lower than now, it often happens that jobbers will make lower prices than the mills. In view of these heavy stocks, held not only by jobbers but by some of the larger consumers, the demand is not likely to improve for some little time. We quote: Black Sheets, box annealed, one pass through cold rolls, No. 24 gauge, 2.10c.; No. 26, 2.20c.; No. 27, 2.20c.; No. 28, 2.30c. We quote Galvanized Sheets as follows: Nos. 22 and 24, 2.75c. to 2.85c.; Nos. 25 and 26, 2.95c. to 3.05c.; No. 27, 3.13c. to 3.23c.; No. 28, 3.35c. to 3.45c. We quote No. 28 Gauge Painted Roofing Sheets at $1.65 to $1.75 per square, and Galvanized Roofing Sheets, No. 28 Gauge, at $2.85 to $2.95 for 2½-inch corrugation. Jobbers charge the usual advances over above prices for small lots from store.

Iron and Steel Bars.—Two or three large season contracts for Iron Bars are in the market, but buyers are slow to close, fearing a further decline in prices. The mills rolling Steel Bars are busy on contracts, and are from three to four weeks behind on deliveries. New tonnage in both Iron and Steel Bars is only of moderate volume, but is expected to materially improve early in July. We quote Common Iron Bars at 1.60c., Pittsburgh, but on nice orders and desirable specifications some mills would shade this price about $1 a ton. We quote Bessemer and Open Hearth Steel Bars at 1.50c. for carloads and larger lots.

Hoops and Bands.—Some new business is being placed, and buyers are specifying freely on old contracts placed some time ago at low prices. We quote Steel Hoops at 1.65c., Bands 1.50c., with usual extras. Cotton Ties are 85c. per bundle for 3000-bundle lots and over.

Tin Plate.—There is practically no new business, and already some of the Tin Plate mills have closed, and others will do so about July 1, for inventory and repairs, and will remain idle until trade improves. Jobbers with large stocks of Tin Plate bought when prices were lower than at present are shading mill prices 10c. a box or more. We quote 100-lb. Cokes at $3.50 to $3.55, base, f.o.b. Pittsburgh, terms 30 days, or 2 per cent. off for cash in 10 days.

Spelter.—The market continues demoralized, only small lots being sold, and very few of these, while prices are weak. We quote Prime grades of Western Spelter at 5c. to 5.05c., St. Louis, or 5.12½c. to 5.17½c., Pittsburgh.

Merchant Pipe.—General conditions in the Pipe trade are reported as fairly satisfactory, the mills having a heavy tonnage booked for the larger sizes, while demand for Merchant Pipe is showing some betterment. There is more uniformity in prices, the independent mills holding quite closely to the prices adopted last November by the leading interest, which are two points, or $4, a ton lower than present quotations. There is absolutely no demand for Oil country goods. Discounts to consumers in carloads, which are shaded to the extent noted above, are as follows:

Merchant Pipe.

	Steel.		Iron.	
	Black. Per cent.	Galv. Per cent.	Black. Per cent.	Galv. Per cent.
⅛ and ¼ inch	67	51	65	49
⅜ and ½ inch	71	59	69	57
¾ to 6 inches	75	65	73½	63½
7 to 12 inches	70	55	68½	53
Extra strong, plain ends.				
⅛ to ¾ inch	60	48	58	46
½ to 4 inches	67	55	65	53
4½ to 8 inches	63	51	61	49
Double extra strong, plain ends, ¼ to 8 inches	56	45	54	43

Boiler Tubes.—New demand continues fairly active and the leading mills that make Boiler Tubes are pretty well filled up. Any cutting in prices on Tubes is being done by one or two small outside mills that do not cut much figure in the open market. Discounts in carloads, which are occasionally shaded, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ inches	41	44
1¾ to 2¼ inches	41	56
2½ inches	46	58
2¾ to 3 inches	53	64
6 to 13 inches	41	56

Merchant Steel.—The demand for Agricultural Steels is moderately active and specifications on contracts are coming in quite freely. Large consumers still hold back placing contracts, waiting until the situation is more clearly defined. There is some irregularity in prices of Shafting, which are being slightly shaded on good orders. We quote: Toe Calk Steel, 2c. to 2.05c.; Railway Spring Steel, 1.65c. to 1.70c.; Finished Tire, 1.65c. to 1.70c.; Sleigh Shoe, 1.50c. to 1.55c.; Smooth Finished Machinery Steel, 1.70c. to 1.75c.; Cutter Shoes, 2.20c. to 2.25c.; Crucible Tool Steel, ordinary grades, 5¾c. to 7c.; special grades of Tool Steel, 10c. and upward. There is a fair demand for Shafting, discounts for Cold Rolled being 50 per cent. off in carloads and 45 per cent. in less than carloads, delivered in base territory. As noted above, these discounts on Shafting are sometimes slightly shaded on new orders.

Railroad Spikes.—The demand for Spikes continues fairly active and the two local mills are pretty well filled up with tonnage for the next several months. We quote Railroad Spikes at $1.70 to $1.75 per 100 lbs., in carloads, f.o.b. maker's mill.

Coke.—Owing to the curtailing of the Pig Iron output the demand for Blast Furnace Coke has fallen off and the general Coke trade is quiet. Some of the smaller plants in the Connellsville region have closed and others are getting ready to do so. We quote strictly Connellsville Furnace Coke for prompt shipment at $1.80 to $1.90, and 72-hour Foundry at $2.35 to $2.40, at oven. On Coke for delivery over last half of this year Connellsville Furnace is held at $2 to $2.10 and 72-hour Foundry at $2.50 to $2.65, at oven. Output of Coke last week in the Upper and Lower Connellsville regions was about 348,000 tons, a decrease over the previous week.

Iron and Steel Scrap.—The Scrap market is about lifeless as far as the demand is concerned and prices are weak and lower. The mills refuse to take in Scrap this month, owing to the shutdown on July 1 for inventory and repairs and adjustment of the wage scale, but an improved demand is expected early in July. We quote: Heavy Melting Scrap, $13.75 to $14; No. 1 Wrought Scrap, $16.50; Wrought Turnings, $11.50; Busheling Scrap, $12.50 to $12.75; Bundled Sheet Scrap, $13.25 to $13.50; Machinery Cast Scrap, $14.50 to $14.75; Cast Iron Borings, $9.50; Steel Rails, short pieces, $13.75 to $14; long lengths, $14.50 to $14.75; Iron Rails, $18.50, all in gross tons, f.o.b. Pittsburgh.

Labor Notes.

The first general strike in ten years of foundry employees in the New York district began Monday, tying up some 24 foundries operated by members of the New York and New Jersey Foundrymen's Association. The strike is to enforce the signing of a new agreement calling for a 25 per cent. advance of wages and the employment of none but members of the International Brotherhood of Foundry Employees. It was known some time ago that the Foundrymen's Association would not agree to any such terms, especially in view of the fact that the wages paid under the old arrangement were considered as high as could be paid and still operate the foundries at a fair profit. From 400 to 500 men are out. Since the organization of the New York and New Jersey Foundrymen's Association a few weeks ago it has steadily increased in membership until now it takes in about every foundry of any size in the immediate vicinity of New York. The association is very strong, and it is claimed will fight the demands of the men, no matter how long the strike lasts. It has started to employ nonunion men to fill the places of the strikers, with so much success that it is believed to be only a question of a short time when all the foundries now closed will be in operation under the open shop plan. The fight against the unions will be carried on somewhat along the same lines and under the same leadership as those against the boiler makers and machinists some time ago, both of which resulted in a complete victory for the New York Metal Trades Association, under the conduct of Henry C. Hunter as secretary, who is also secretary of the Foundrymen's Association.

On June 1 wages of machinists, molders, core makers and blacksmiths employed by concerns that are members of the Manufacturers' Association at Pittsburgh were voluntarily advanced 10 per cent., in conformity with the notice of such advance given by the employers on April 21. Machinists in the Pittsburgh district are paid on a graduated scale, the minimum rate now being 27 cents an hour, while the maximum rate, paid to a very few skilled men, is 45 cents an hour. The minimum rate for molders has been $3 a day, and up to $4 a day is paid for the highest skilled labor. Labor conditions in the foundries and machine shops in the Pittsburgh district are now on a very satisfactory basis.

The American Anti-Boycott Association has won another victory in its suit against the United Hatters of

America and the American Federation of Labor, better known as the Danbury boycott case, in which suit was brought nearly two years ago under the Sherman Anti-Conspiracy act and under the Connecticut State laws. The decision of the Superior Court of Connecticut overrules the defendants' demurrer, which was designed to cause the case to be thrown out of the State courts. The Court found that the plaintiff may maintain action in the courts of Connecticut to determine whether the means employed by the union in entering into a conspiracy or combination to injure the business of the plaintiff, Dietrich E. Loewe and others of Danbury, were lawful. The action now seems to have been established in both the State and United States courts.

The foundry operators at Youngstown, Ohio, posted notices last week of an increase for molders and core makers of 10½ per cent., effective on June 1, this increase to be given men already under employment and conditional upon a renewal of the old contract, which would leave the minimum wages $2.85 for molders and $2.65 for core makers. The present contract between the founders and their molders and core makers does not expire until July 1, but notice must be given by either side 30 days prior to expiration of the scale of any intention of changing. The founders at Youngstown have since received notice from their molders and core makers that they do not wish to renew their contract, but as yet no conference has been held and the founders do not know at this time what new demands their molders and core makers will make. In any event they are expected to ask for a material increase over the present wage rate.

American and European Railroad Cars.—A recent paper by Mr. Biard, chief engineer of rolling stock of the Eastern Railway of France, says that while in the United States traffic conditions require very large cars the conditions in Europe do not warrant large cars to any great extent. In England the cars are 15 to 16 feet long, with two axles; they have a capacity of 6 to 10 tons and a dead weight of 5½ to 7¼ tons. The practice of forwarding small shipments promptly, the large private ownership of freight cars (about 50 per cent. of the total), and the changes at freight yards, coaling docks, mines, &c., which would be necessary to accommodate the large cars, all tend to a continuance of present practice. Some railways, however, are using 30 and 40 ton cars mounted on trucks, and 15 and 20 ton cars on two axles. These are mainly for coal and ore traffic. In Germany a 15-ton car with steel frame and two axles is practically the standard, although some experiments are being made with 40-ton pressed steel cars on trucks, 30-ton cars on three axles and 20-ton pressed steel cars on two axles. In France 10 and 15 ton cars are used; and there are in service about 20,000 steel cars of 20 tons capacity, on two axles, weighing only 7½ to 7¾ tons. Some 30, 40 and 50 ton steel cars are in use (the 40-ton cars weighing 14 tons), and are mounted on trucks, but Mr. Biard does not favor the use of trucks for cars of less than 40 tons capacity.

Mexican Tin.—W. A. Pratt, assayer at Aguas Calientes, Mexico, for some years, has organized the Consolidated Tin Mining & Smelting Company of Mexico, and on February 23 his company smelted from the tin ore deposits near Aguas Calientes an ingot of tin weighing 50 pounds, believed to be the first ingot of Mexican tin. The vein is said to be about 5 feet wide, containing stringers of tin, and can be traced for a mile. The vein is said to run from 2½ to 4 per cent. tin, which compares well with Cornwall ore, most of which runs less than 1 per cent. There is about 1 per cent. of iron in this vein. Over 200 years ago the Spaniards worked deposits of float or placer tin about 40 miles from Aguas Calientes, and the vein now being worked was evidently the source.

S. V. Huber & Co., Ferguson Building, Pittsburgh, have been appointed consulting engineers for the new plate mill to be built by the Youngstown Sheet & Tube Company, Youngstown, Ohio.

PERSONAL.

James Lamont, formerly of the Homestead Works of the Carnegie Steel Company, has been appointed master mechanic of the Donora plant of that company.

Harry W. Mohr has been appointed superintendent of the Carrie blast furnaces of the Carnegie Steel Company, at Rankin, to succeed George K. Hampfeldt, recently resigned.

John M. Hayden has been appointed manager of the branch office of the Jones & Laughlin Steel Company at Duluth, Minn.

William Tuomey, secretary of the American Trading & Storage Company, Chicago, which is known as the scrap department of the Griffin Wheel Company, has been made general manager of the Sellers Mfg. Company, whose plant for making rail joints and tie plates is at West Chicago avenue and the river. Mr. Tuomey has been associated with the Griffin interests for many years.

C. E. Clapp, fourth vice-president and general sales agent since the formation of the Crucible Steel Company of America, Pittsburgh, has resigned. Mr. Clapp intends to move to his stock farm in Virginia. He has been actively connected with the steel trade for 26 years.

George Surgeon has been appointed assistant superintendent of the Pioneer Iron Works, Brooklyn, N. Y., and will act as superintendent in the absence of Joseph A. Rockwell, superintendent.

Max McMurray, general superintendent of the blast furnaces controlled by M. A. Hanna & Co., Cleveland, who has been ill for several months, has resumed his duties.

R. W. Ney of Cleveland, manager of the wire mills of the American Steel & Wire Company, is spending the month of June at Hot Springs, Va.

Dr. George Revay, 45 Cedar street, New York, has returned after an extensive business trip in Europe, during which he attended the meeting of the Iron and Steel Institute.

W. P. Culver, formerly with the Cleveland Motor Car Company, is now the Eastern representative of the Diamond Chain & Mfg. Company of Indianapolis, Ind., and will have headquarters in New York.

Bruno Poensgen of the Düsseldorfer Roehren & Eisenwerke, Düsseldorf, Germany, is making a tour of the leading iron and steel works of the United States and Canada. His itinerary includes New York, Pittsburgh, Cleveland, Chicago, Milwaukee, Denver, Pueblo, San Francisco, the Yellowstone Park, Black Hills, Duluth, Toronto, Montreal and the New England States.

C. W. Post, Battle Creek, Mich., recently chosen president of the Citizens' Industrial Association of America to succeed D. M. Parry of Indianapolis, has named James A. Emery of San Francisco as secretary of the association. The headquarters are to be in New York.

C. J. H. Woodbury of Boston delivered the address on June 9 at the commencement exercises of the Thos. S. Clarkson Memorial School of Technology, Potsdam, N. Y. His subject was "The Engineer as an Economist."

Charles R. Darrow has resigned as president and general manager of the Mahoning Foundry & Machine Company, Youngstown, Ohio.

William Ahlen, chief engineer of the Duquesne Steel works and blast furnaces of the Carnegie Steel Company, Duquesne, Pa., has been given a three months' trip to Europe by the company for faithful service, and will sail on the steamer St. Louis June 17.

J. N. Wallace has been elected a director of the Sloss-Sheffield Steel & Iron Company, to succeed William Strong, deceased.

The Pressed Steel Car Company of Pittsburgh has received an order for 900 box cars for delivery to the Japanese Government. The cars will be 3½ feet gauge, 15 feet long and will have a carrying capacity of about 7 tons.

New York.

NEW YORK, June 14, 1905.

Pig Iron.—During the week a strike has developed in the New York City and Brooklyn foundries in which some of the minor New Jersey foundries are also involved. The great majority of them are small, however, the large plants in the district not being affected. The market has been very dull during the week and prices are receding slowly. We quote for Northern Irons, at tidewater, $17 to $17.50 for No. 1 Foundry, $16.50 to $16.75 for No. 2 Foundry and $16 to $16.25 for No. 2 Plain. Southern Iron is selling on the basis of $15.75 to $16 for No. 2 Foundry.

Steel Rails.—There is quite a run of orders for moderate lots and the mills are well supplied with work for some time to come. We continue to quote $28 for Standard Rails and $23 to $25 for Light Sections, at mill.

Cast Iron Pipe.—The foundries are receiving a considerable volume of business, but all of it at present is in the nature of small orders. These orders are also almost entirely for small sizes of Pipe. The demand this year appears to have run much more than usual toward small sizes, and consequently the foundries are well filled with work of this character, while on large sizes their order books are not nearly so well supplied. Prices therefore are quite firm on small sizes, but competition would be sharp on new business involving the larger diameters. Carload lots are quoted at $28 per net ton for 6-inch at tidewater.

Finished Iron and Steel.—The most important contract placed in the Structural line during the week was an order given by the new Deep Water system in Virginia to the American Bridge Company for 6000 tons of bridges. The other orders placed were numerous, but the quantities involved were usually small. The work now coming in covers all kinds of construction and all sections of the country are well represented. In this immediate vicinity quite a number of inquiries are coming up for Steel for moderate sized buildings. The local outlook in this line is very much better than it has been, and builders are feeling decidedly cheerful over the prospects for the remainder of the building season. Deliveries of Structural Material are no better than they have been, except in some sizes of Plates. The Plate trade is fairly active for this locality, considering the slackness in the local shipyards. Orders are coming in for Plates to be used in bridge work as well as in connection with building operations. The largest order of the week called for about 700 tons. The Eastern manufacturers are crowded on such sizes as are made on their smaller mills, while on the heavier Plates deliveries can now be made in two to three weeks. The Bar situation continues as it has been, with prices firmly held, but only a moderate volume of business in progress. Quotations, at tidewater, are as follows: Beams, Channels, Angles and Zees, 1.74½c. to 1.84½c.; Tees, 1.79½c. to 1.89½c.; Bulbs, Angles and Deck Beams, 1.84½c. to 1.94½c.; Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine, 1.94½c. to 2.04¾c.; Fire Box, 1.94½c. to 2.50c., according to specifications; Refined Bar Iron, 1.64½c. to 1.74½c.; Soft Steel Bars, 1.64½c. to 1.74½c.

Old Material.—Relaying Rails continue in good demand and inquiries are out for some heavy tonnages of certain sizes which are badly needed. The demand for rolling mill stock, which had been growing the past two or three weeks, has received a setback, probably due to offerings by dealers in greater quantities than the market was prepared to take. Sellers endeavored to force too much on the buyers, who were sounding the market rather than trying to accumulate much stock. Prices on this grade of Material therefore show further shrinkage. The demand for Cast Scrap has been considerably better than for rolling mill stock, but it is now likely to be adversely affected by the strike in the foundries of this city and vicinity. Notwithstanding the dullness in this trade at present, dealers are still of the opinion that the market will show decided improvement before the summer has advanced very far. It is significant in this connection that some buyers of Scrap are endeavoring to make purchases at present prices for delivery after August 1, but, so far as known, without success. Prices per gross ton, New York and vicinity, are approximately as follows:

Old Iron Rails	$17.50 to $18.50
Old Steel Rails, rerolling lengths	13.50 to 14.50
Old Steel Rails, short pieces	13.00 to 14.00
Relaying Rails	20.00 to 21.00
Old Car Wheels	15.00 to 16.00
Old Iron Car Axles	18.50 to 19.00
Old Steel Car Axles	17.00 to 17.50
Heavy Melting Steel Scrap	13.00 to 14.00
No. 1 Railroad Wrought Scrap	16.00 to 17.00
No. 1 Yard Wrought Scrap	14.50 to 15.00
Iron Track Scrap	14.00 to 14.50
Wrought Pipe	11.00 to 12.00
Ordinary Light Iron	8.00 to 9.00
Cast Borings	7.00 to 7.50
Wrought Turnings	10.00 to 11.00
No. 1 Machinery Cast	14.00 to 15.00
Stove Plate	11.50 to 12.00

Metal Market.

NEW YORK, June 14, 1905.

Pig Tin.—The market was quiet up to Friday of last week, when a good business was done and sales were made at 30.10c. This increase in business stimulated the London market so that the next day of trading, Tuesday, on that exchange brought a considerable advance there and on that day sales were made at 30.30c. to 30.35c. While a fair inquiry developed during the day, but few of these inquiries were turned into orders on account of the high price. This recent advance in London has all the indications of a purely manipulative move. To-day's closing quotations in London were £137 17s. 6d. for spot and £136 10s. for future. In New York the closing prices were 30.25c. to 30.50c. for spot, 30.20c. to 30.45c. for June, 29.95c. to 30.25c. for July and 29-75c. to 30.12½c. for August. The arrivals so far this month aggregate 1145 tons and the afloats 1793 tons.

Copper.—Business during the week was somewhat restricted and the sales made were chiefly in small lots to domestic consumers for nearby deliveries. The actual shipments to China and the East have not been so large during the past few days, yet there is a good sized shipment scheduled in the near future. It remains to be seen, however, what the trend of the market will be when China stops buying, as the takings of that country have been at a rate of 60,000 tons a year, or about 8 per cent. of the world's total production, and this demand has helped to keep prices at the present level. The quotations are unchanged, 15c. being the price of Lake and Electrolytic grades, while 14¾c. is the price for Casting. In London prices have advanced to £66 for spot and futures. Best Selected is now held at £70 15s. The exports so far this month aggregate 8073 tons, of which about 600 tons go to China.

Pig Lead.—The demand is quiet and prices are unchanged at 4.50c. to 4.60c. The American Smelting & Refining Company continues to quote shipment Lead in 50-ton lots at 4.50c. In St. Louis the price has advanced slightly to 4.42½c., while in London a slight advance is also noted, being held there at £13.

Spelter.—The market is somewhat steadier, due to better buying, both in the East and in the West, and 5.35c. is the general quotation for spot, and 5.25c. to 5.35c. for deliveries in June, July and August. Shipments from the West are held on a basis of 5.10c., St. Louis.

Antimony.—Business is very dull on account of the large amount of this metal in the hands of one concern. All grades are now held nominally at 11c. to 11½c.

Quicksilver.—The market is unchanged, flasks of 75 lbs. being quoted at $38. In London Rothschild's price is £7 7s. 6d.

Nickel.—The market is quiet, and prices remain unchanged, large lots being quoted at 40c. to 45c. and smaller at 50c. to 60c.

Tin Plate.—The good demand continues, and the price of $3.74 a box for 100-lb. IC Coke Plates is firmly maintained.

Through the courtesy of L. Vogelstein, the American representative of Aron Hirsch & Sohn, Halberstadt, Germany, we give the following figures for the German consumption of foreign Copper for the months of January to April, 1905:

	1905. Tons.	1904. Tons.	1903. Tons
Imports	32,172	40,859	27,260
Exports	4,413	2,651	3,833
	27,759	38.208	23,427

Of the above 26,720 tons were imported from the United States.

Heads of leading pig iron producing companies of eastern Pennsylvania and New Jersey were guests of the Central Iron & Steel Company, Harrisburg, Pa., June 14. Luncheon was served at the company's offices. The blast furnaces, open hearth steel works and plate mills were inspected and trade conditions were discussed. The companies represented by presidents or other officers were the Warwick Iron & Steel Company, Lebanon Valley Iron Company, Allentown Rolling Mills, Empire Steel & Iron Company, Thomas Iron Company, Reading Iron Company, Pequest Company, Carbon Iron & Steel Company, Musconetcong Iron Works, Durham Iron Company, E. & G. Brooke Iron Company, Pennsylvania Steel Company, and Pilling & Crane and Rogers, Brown & Co. It was stated that nearly all eastern Pennsylvania furnaces are working and considerable tonnage ahead, although not much has been doing since June 1. Marshall Furnace, Newport, Perry County, Pa., has been blown in.

Iron and Industrial Stocks.

NEW YORK, June 14, 1905.

Various influences affected the stock market and particular stocks during the past week. The improving prospects of peace in the Far East had the most important effect in advancing some stocks. The United States Steel stocks reached a maximum of 95½ on Monday and Tuesday for the preferred, as compared with a low point of 92¾ on the previous Friday, while the common touched 28½, as compared with 26⅛. Tennessee Coal, which had sold at 75 on Thursday of last week, touched 79 on Monday of this week. Republic preferred advanced from 71½ to 74¼ in the same time. Colorado Fuel also showed a good advance from 40¾ to 43¼. Locomotive common advanced from 46¾ to 48¾. On the other hand, American Steel Foundries was under pressure during the greater part of the week, declining from 43 on Saturday to 39 on Tuesday. The common stock sold down to 8½ on Thursday of last week, which is the lowest point touched on this downward movement, recovering to 11½ on Monday. Last transactions in active stocks up to 1.30 p.m. to-day were reported as follows: Can common 11⅝, preferred 69; Car & Foundry common 34¼, preferred 97½; Locomotive common 48, preferred 111; Colorado Fuel 42⅛; Pressed Steel common 37½, preferred 92; Railway Spring common 31, preferred 95⅝; Republic common 17¾, preferred 73½; Sloss-Sheffield common 73½, preferred 107; Tennessee Coal 77½; Steel Foundries common 9½, preferred 36; United States Steel common 27⅞, preferred 94⅝, new 5's 93.

At the annual meeting of the stockholders of the International Steam Pump Company, held June 13, the retiring Board of Directors was re-elected, with the exception of H. B. Hollins, who resigned, and who was succeeded by J. B. Haggin. The annual report may not be made public for two or three weeks.

The statement of earnings of the Sloss-Sheffield Steel & Iron Company for the quarter ended May 31, made public June 13, compares with the corresponding period a year ago as follows:

	1905.	1904.	Increase.
Profit from operations	$428,485	$278,485	$150,000
Interest and taxes	60,000	60,000	.....
Balance	$368,485	$218,485	$150,000
Dividend preferred stock	114,000	114,000	.....
Surplus	$254,485	$104,485	$150,000
Actual surplus on March 1	2,475,245	2,344,261	130,984
Surplus to June 1	$2,729,730	$2,448,746	$280,984

A special meeting of the stockholders of the National Lead Company is to be held June 26, to consider the proposition to increase the preferred stock from $15,000,000 to $25,000,000 and the common stock in a like amount. Among the reasons given for this proposed increase of stock are the following: Since the organization of the company in 1891 the tonnage of its business has increased 40 per cent., necessitating the employment of larger working capital than was originally believed to be necessary. The result of the past experience of the company has been to convince the Board of Directors that the acquirement of additional manufacturing properties by the company and the consequent increased tonnage of its business would result in a larger percentage of net profits earned. The whole increased capital stock thus authorized will not be issued at once, and none of it will be issued at any time except for the purchase of additional properties or the further increase of the company's working capital from time to time as in the judgment of the board the interests of the company require.

Dividends.—Sloss-Sheffield Steel & Iron Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable July 1.

American Can Company has declared the regular quarterly dividend of 1¼ per cent. on the preferred stock, payable July 1.

Otis Elevator Company has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable July 15.

General Electric Company has declared the regular quarterly dividend of 2 per cent., payable July 15.

Westinghouse Air Brake Company has declared the regular quarterly dividend of 2½ per cent. and 2½ per cent. extra, payable July 11.

United Shoe Machinery Company has declared a quarterly dividend of 2 per cent. on the common and 1½ per cent. on the preferred stock, both payable July 15.

Catalogues Wanted.—V. Cascino, post office box 911, Mexico City, Mexico, a contractor and importer, wishes to communicate with American manufacturers relative to the sale of goods in Mexico and asks for catalogues and circulars. Mr. Cascino recently closed a contract for the sale of 2,000,000 square feet of expanded metal to the Mexican Government.

New York Pig Iron Warrant Market.

NEW YORK, June 14, 1905.

The pig iron warrant certificate market was rather dull the past week, with sales of only 700 tons. Of this amount 100 tons, cash, were sold at $14.50; 200 tons, June, $14.50; 100 tons, July, $14.50, and 200 tons, July, $14.60; 100 tons, October, $14.45. No sales of foundry certificates were reported. The following quotations were established on call Wednesday noon:

	Regular.		Foundry.	
	Bid.	Asked.	Bid.	Asked.
Cash	$14.50	$14.65	....	....
June	14.50	14.60	$15.00	$15.75
July	14.50	14.55	15.00	15.25
August	14.40	14.45	....	....
October	14.40	14.50	15.00	15.30
November	14.25	14.70	....	....
December	....	....	....	....
February	....	14.75	15.25	15.35

The American Pig Iron Storage Warrant Company, 44 Wall street, New York, reports the following stock of pig iron in its warrant yards on hand May 31, 1905:

	Gross tons.
Stock on hand April 31	72,350
Received during May	13,300
Total	85,650
Delivered during May	4,400
On hand May 31	81,250

The Republic Iron & Steel Company.—A number of reports are current concerning the Republic Iron & Steel Company which are misleading, particularly since they possess some basis of truth. Among these is that a consolidation with the Youngstown Sheet & Tube Company is contemplated. The fact is that the Republic interest some time since made an offer for the Youngstown works, which was not accepted. Since then the latter company has decided to put up a Bessemer plant and has made a contract for pig iron on a sliding scale basis with a number of Mahoning Valley blast furnaces. It is true, as already stated, that the executive offices of the Republic Company will be removed to Youngstown. A building in Youngstown has already been leased and the removal to that city will be made about July 1. At the last meeting of the directors a committee, consisting of John W. Gates, Charles S. Guthrie and L. C. Hanna, was appointed to effect certain changes in the administrative force of the company, which, however, cannot go into effect until October. It is true that negotiations have been opened with Frank Baackes of the American Steel & Wire Company, to accept the presidency of the Republic Company. Mr. Baackes, who has just returned from Europe, has the matter under consideration, but has not yet made a decision. It is true also that the building of a wire mill has been discussed favorably, but no contracts have yet been let. It is also true that the Republic Company has taken orders for steel rails aggregating 20,000 tons, and that negotiations for further round lots are pending.

The Government dry dock built by the Maryland Steel Company at Sparrows Point, Md., was successfully floated on June 2. This is the largest floating dry dock in the world. It will lift 24,447 tons and cost $1,125,000. After satisfactory tests in the Chesapeake Bay it will be towed to the Philippine Islands for use in those waters.

The Canadian tariff, revised to May, 1905, will be found in full in the *Monthly Summary of Commerce and Finance of the United States* for April, just issued by the Bureau of Statistics, Department of Commerce and Labor, Washington, D. C.

A Berlin dispatch states that the commercial treaty which Germany will present to the United States in July is now being drafted from reports of commercial bodies.

Henry Harnischfeger of Pawling & Harnischfeger, Milwaukee, sails for Europe to-day for a two months' respite from business cares.

The Machinery Trade.

NEW YORK, June 14, 1905.

The machinery trade is gradually assuming its normal summer condition, with orders coming in about as good as can be expected for this season of the year. As a rule business begins to fall off in June and does not return to an active state until all are home from their vacations. Thus far this month has resulted in a fairly good business and satisfactorily generally to merchants. The activity in the machinery market during the past week has been caused to a great extent by the large orders placed by the Erie Railroad and the steady buying by the Pennsylvania Railroad. While inquiries are not quite as numerous, another large one has been received from the Public Service Corporation of New Jersey, which has heretofore been a large purchaser and whose requirements are further referred to in these columns.

In view of the railroad lists now before the trade a great deal of interest is being manifested in the conventions of the Railway Master Mechanics' and Car Builders' associations, which opened at Manhattan Beach on Wednesday. It is generally thought that these conventions will tend to defer closing for the lists for a week or ten days, but at the same time they will afford a good opportunity for the machinery merchants of this city to become better acquainted with the men who have something to say as to the tools to be used. It is hoped that the coming of the master mechanics and car builders will divert a good share of future orders to this market.

Dealers in conveying machinery, hoists and the like continue to do a good business, as was stated here last week. An illustration of the activity in this branch of the trade is shown by the efforts of a number of purchasers to obtain quick deliveries for hoists, with the result that they could get no promises of delivery under eight and twelve weeks from a number of firms to which inquiries were sent.

Mayor McClellan has appointed J. Edward Simmons, Chas. A. Shaw and Chas. N. Chadwick as the Municipal Water Commission which will have full charge of the proposed $100,000,000 improvement of the city's water supply. It is expected that the new commission will shortly get to work on the plans, the consummation of which will no doubt lead to the purchase of considerable pumping and power machinery in the near future.

Consolidation of Drill Manufacturers.

The Ingersoll-Sergeant Drill Company and the Rand Drill Company have been united under the title of the Ingersoll-Rand Company with a New Jersey charter and $10,000,000 capital, of which $5,000,000 is preferred and the remainder common stock. The announcement of the union of these two important companies was made on Monday and at the same time the statement was made that the patents held by them will hereafter be used jointly, use being made of the more valuable patent rights secured by both companies. The consummation of the plans will entail some changes at the seven factories which the new corporation controls as a result of the union of interests. Just what will be done in that respect has not been fully decided as yet, as only the general plans of the consolidation have been gone over. Some Ingersoll-Sergeant methods of constructing machines will be applied to Rand products and a number of the Rand patents will be used on the Ingersoll-Sergeant drills. The rule of combination of patents and ideas will be applied to air compressors as well as to the other machines made by the two companies. As an instance of this plan it has already been decided to apply the Ingersoll-Sergeant method of rotation to the Rand Little Giant drill. In many other instances exchanges of methods will be made.

The factory changes which will follow the union will naturally necessitate the installation of new machinery at some, if not all, of the plants. Just what will be done in this respect the officers are not ready to announce. The Ingersoll-Sergeant Company controlled two large factories, one at Phillipsburg, N. J., and another at Easton, Pa., while the Rand Company had factories at Tarrytown, N. Y.; Painted Post, N. Y.; Ossining, N. Y.; New York City and Sherbrooke, Conn. The Ingersoll-Sergeant Company was the larger of the two, its output perhaps doubling that of the Rand Company. The officers of the newly formed corporation are W. L. Saunders, president; G. Doubleday, J. R. Rand, J. A. McCall, J. P. Grace and Geo. R. Elder, vice-presidents; G. A. Brainard, secretary, and W. R. Grace, treasurer. Mr. Saunders was formerly president of the Ingersoll-Sergeant Drill Company, while Mr. Rand held a similar position with the Rand Company. The two companies were each about 35 years old and they were active competitors during that time. Some 25 years ago the Rand Drill Company was the larger of the two, but the Ingersoll-Sergeant Company outpointed the Rand Company in growth in later years. For the present the Ingersoll-Sergeant Company will continue to occupy its general offices in the Havemeyer Building on Cortlandt street, while the Rand Company will maintain its general offices at 120 Broadway. Later on, it is supposed, when the details of the union are completed, the offices will be combined.

Public Service Corporation Improvements.

Arrangements for the construction and equipment of new machine, repair and car building shops, to be built at the Plank Road shops of the Public Service Corporation of New Jersey, Newark, N. J., are about completed, and the work of construction will be begun in a short time. It is understood that the company has some inquiries for mechanical equipment in the trade at present, although from all accounts it has not sent out a full list of what it intends to purchase. The corporation, as has been told in *The Iron Age*, intends to have all its more important repairing done at the plant, and in addition it expects to build some, if not all, of its new cars there. Later on, if the car building industry proves successful, there will probably be an extension of the plant. The plans call for a main building, 140 x 338 feet, which will include the machine shop and the foundry, and in addition there will be a wood working department, repair shop, storeroom, paint shop and a room for storing paint, as well as a boiler house, 40 x 50 feet. The paint shop will include a finishing room. There will be an erection shop and wood working department, 140 x 286 feet; dry kiln, 18 x 53 feet, and an oil house, 35 x 58 feet. Two steel tanks, one capable of holding 2,500,000 gallons of water, and the other of 500,000 gallons capacity will be installed. The structures will all be of steel and concrete construction with modified saw tooth roofs. When completed the shops will be models of their kind, and although some of the machinery already in use at the old shops will be put into service, much will be bought in the way of new machinery for the plant. At one side of the large shops will be installed 22 new car lifts of the most modern type. The floor plans of the large shop also show that there will be fifteen armature stands, seven feed winders, six tests, two band sawing machines, two boring mills, two milling machines, seven lathes, five shapers, two radial drills, four drills, a sensitive drill, universal grinder and several smaller machine tools. The wood working department equipment will include a molder, three rip saws, two planers, two boring machines, a band saw, router, panel raiser, a tenoning machine and other wood working machinery. About 500 horse-power will be used at the plant, and four boilers will be put into service, although the company will probably use boilers already on hand. The machinery mentioned here does not constitute the entire equipment of the new plant, and for some little time to come the trade can look for a liberal patronage from the Public Service Corporation. Through its rapid growth in the last few years the company has come to be looked upon as an important factor to the trade in this city, where the majority of its buying is done and its doings are closely followed. The machinery buying, it is understood, will be done from the company's Newark office in the Prudential Building. Col. Charles A. Sterling, one of the vice-presidents, has charge of the arrangements for the construction and equipment of the plant.

Railroad and Other Machinery Requirements.

Not for some time has a machinery list aroused so much interest among machinery manufacturers and their New York representatives as that of the Erie Railroad, which is now sending in its orders. There has been considerable speculation as to the amount of the purchases thus far made and the number of machines on the list which have been contracted for. This will probably not be known for months, as the orders were pretty well scattered. From official figures we stated here last week that $145,225 had been appropriated for new high speed steel tools, and it is apparent that the purchases aggregated that amount in value, as the road is very much in need of a large amount of additional machine tool equipment. We also stated from official figures that the officers of the company here decided to buy $85,000 worth of additional tools for certain shops, appropriation for which is likely to be made at any time. This is important as showing that the Erie Railroad Company will be a large buyer for some time to come. It will be remembered that the list which was scaled down considerably covered machinery valued at over $300,000. There is very little doubt but that a great deal more than that amount of machinery will be eventually bought, as we understand from a reliable authority that the company is planning to buy no less than $500,000 worth of mechanical equipment.

Certain machinery houses in New York are awaiting with some expectancy the result of their bidding on the large machine tool list recently sent out by the Norfolk & Western Railroad. The list was not generally distributed, but was sent out rather to a selected number of machinery men in this city. Others who have pursued the purchasing department of the railroad have been unable to "get in," although a few who were overlooked, it is said, were handed belated lists. It has been given out that about everything on the list will be purchased. Although the list was not sent

to New York houses exclusively, it is safe to say that a substantial proportion of the orders will be placed in this city.

The New York & Interborough Railroad Company, New York, which is a subsidiary company of the Belmont interests, has planned to construct several lines of surface trolley lines in the Bronx. A contract for constructing about 25 miles of the lines has been awarded to the John J. Hart Company, Broadway and 175th street. A. E. Colbach, who is at the Interborough offices, 21 Park row, is the engineer in charge of the work, and he is purchasing all the materials and machinery to be used in connection with the construction work.

The Pennsylvania Railroad is preparing to add to the power house at its shops at Altoona, Pa., and the improvement will be one of some consequence. It is said in the trade that inquiries have been sent out for some special machinery to be installed there independent of the lists sent out some time ago. It is also declared that the item for conveying machinery probably intended to carry coal and ashes for the power station will aggregate $30,000. The other expenditures for the extention will be equally proportionate, and the trade is following the improvement very closely. The Pennsylvania maintains an extensive system of shops at Altoona, and it has been known for some time that conditions there were somewhat crowded. It is understood that the improvement will be completed during the summer.

The Edison Company has not closed as yet for the four 20-ton cranes for which it had an inquiry in the market some time ago. In the trade this company is looked upon as a possible purchaser of machinery in the near future. The company is constructing a power station uptown, and although it has been stated that the machinery for it was arranged for in the budget of last fall, it is expected that there will be some requirements when it comes time to complete its equipment. The company has been purchasing machinery and cranes for its substations.

Quite a quantity of machinery will be required by the E. R. Thomas Motor Company, Buffalo, N. Y., for equipping its new plant. There will be installed an electric plant, and the company will add 15 to 20 new machines, such as Gisholt and Hendey. The new building will be constructed of steel, concrete and glass, and will be 50 x 450 feet, four-stories high. The cost of the new plant is expected to reach $75,000.

The Harris Safety Company, with offices at 1133 Broadway, New York, has about completed its negotiations for the purchase of a foundry and machine shop at Youngstown, Ohio, where it expects shortly to move its plant from this city. The company manufactures fire escapes and other safety appliances, and it will discard some of the machinery at its newly acquired property and substitute some better fitted to its needs.

A small list of machinery requirements is being sent out by the Davis Foundry & Machine Works, Rome, Ga., covering a 10-foot vertical boring and turning mill, two heads; one milling machine for general machine shop work, one planer about 44 x 48 inches by 9 to 10 feet, two 7-ton hand traveling cranes with 35 feet span, one small compressed air drilling and chipping outfit. If in first-class condition second-hand tools are preferred.

Within the next few weeks the Thomas C. Basshor Company, Baltimore, Md., will be in the market for some motors and a second-hand generator, sizes of which have not yet been determined. All other machinery for the company's new boiler shop has been purchased.

Municipal Work.

The city of Baltimore, Md., is preparing to build a $10,000,000 sewer throughout the municipality to take the place of a number of independent sewer systems and furnish the city with an up to date disposal system, of which it has been in sad need for many years past. At present there is no general sewerage system in Baltimore and the undertaking will be one of some magnitude. A great deal of construction machinery will be used on the work, which it is expected will be gotten under way during the present summer, while there will be much to buy in the way of pumping machinery. Though Southern dealers will probably capture a goodly portion of the orders for machinery, it is expected that New York will get a fair share of the trade. The commission appointed by the Mayor to take charge of the plan has not as yet selected a consulting engineer, but it is understood that as soon as one shall be selected the work of construction will be gotten under way as soon as possible.

Sealed estimates will be received at the headquarters of the Fire Department of the City of New York next Tuesday for furnishng the labor and materials for erecting and completing the equipment of the new repair shops of the department at Fifty-sixth street and Twelfth avenue, Manhattan. The security required is $13,000 and 90 days will be given for fulfilling the contract. At the same time bids will be open for erecting and completing two electric elevators in the shops and 60 days will be given for completing the contract, while $5000 will be required as security.

New England Machinery Market.

WORCESTER, MASS., June 13, 1905.

The condition of the machine tool business in New England has changed but little during the past week. The manufacturers report that the demand continues to be generally satisfactory. Foreign business continues to be booked on the same general basis of increase that has characterized the demand of the past few months as compared to the previous two years.

The New York, New Haven & Hartford Railroad has now practically decided to erect locomotive repair shops at Norwood, Mass., a suburb of Boston, at a cost of $1,000,000. It will be a very extensive establishment, as the cost indicates, and the machine equipment will be a very large and costly one. The capacity will be 45 locomotives, which is much larger than the usual plant for this class of work. The list of tools will be a long one; there will be several cranes of large capacity, the boiler and forge shops will require extensive apparatus and appliances, and there will be a wood working shop, tinshop and a large power plant to furnish electric power, which will be employed throughout the works. It cannot be said, however that the matter is entirely settled, for there may be a hitch in procuring the necessary land in Norwood adjacent to property owned by the company upon which there now stand locomotive repair shops of comparatively small capacity. If this obstacle should arise another site may be chosen or it might be decided to erect the plant on property now owned by the company at Norwood, but this latter alternative is not a desirable one. There is land enough, but to employ it would mean a great deal of filling and the most substantial foundations will be necessary for buildings of the character as planned. Consequently the effort is being made to get possession of the necessary additional area, but owing to it being cut up into small parcels there is some apprehension of failure, as the owners are liable to ask exorbitant prices for their holdings, which will result in their retaining possession.

These shops will be to the locomotive repair work what the Readville shops, recently constructed, are to the car repair end of the work. The Readville shops have shown a great economy as compared to the old system of car shops, which was not unlike the present condition of the locomotive repair department. The success of the Readville shops has given a maturing impetus to a plan several years old to build a modern plant for the repair of locomotives. The company maintains a number of small shops, which are scattered here and there among its various divisions, and in some instances inconveniently situated as to the centers of traffic. They are generally equipped with machinery of old pattern, which adds to the cost of making repairs in comparison with the modern shop. Some of these shops are obsolete. The small shops will be abandoned for the most part. Others will be retained only as adjuncts to locomotive roundhouses. The shops at New Haven, Conn., will undoubtedly remain as they are, for the new shops are intended not for the entire system, but for the eastern territory.

The present plant at Norwood was established years ago, when the New England Railroad operated the line upon which it stands. Of late years several small shops in other places near Boston have been concentrated there, but even now it is not a large shop. As already stated, there may be a slip in the culmination of the present plan. An expert in railroad shop construction and equipment is working out the plans. It is generally considered by the officials of the company that the whole thing will be carried through as contemplated. It may be that another site will have to be selected. But the fact remains that it is nearly certain that very large orders for equipment will be placed before many months have passed.

The Turner Tanning Machine Company, Boston, Mass., is to erect a large addition to its shops at South Boston. Plans are not completed, so that the size of the plant cannot be stated, but it will be a material addition. The company states that it will require a considerable number of machine tools of all sorts and all of them motor driven. A new power plant will be built, and the company will be in the market for a 150 horse-power engine, generator and boiler.

Plans are consummating for the establishment of a new drop forging plant at Easthampton, Mass., under the management of William L. Barnett, formerly foreman of the drop forging department of the Trimont Mfg. Company, Boston. It is proposed to erect a plant 40 x 140 feet. None of the machine and other equipment has been purchased. A corporation is now forming for carrying on the business.

The Becker-Brainard Milling Machine Company, Hyde Park, Mass., has occupied its large addition, which was formerly the plant of the Boston Blower Company, now merged into the B. F. Sturtevant Company. This addition gives the Becker-Brainard Company about 50 per cent. additional manufacturing capacity.

The Boston & Albany Railroad is contemplating the purchase of a wrecking crane of 100 tons capacity for use about its yards at West Springfield, Mass., where the repair

shops are located, and in case of wrecks. The crane would replace one of 25 tons capacity.

The Pope Mfg. Company, Hartford, Conn., makes the important announcement that the entire bicycle business of the Hartford shops will be removed to the company's plant at Westfield, Mass., the change to take place immediately. The space made vacant at Hartford will be devoted to the building of a new Pope automobile truck. The company states that it is not in the market for new machine tools or other equipment at this time. It is to be presumed, however, that tools will have to be purchased to meet the needs of the enlarged automobile department at Hartford.

A new engine and boiler will be purchased for the State Prison at Concord, N. H.

J. E. Smith & Co., manufacturers of builders' finish, &c., Waterbury, Conn., will need new machinery for a new mill to be erected immediately, to be 54 x 125 feet, and three stories and basement. Electric power will be employed and direct connected motor drive on the new machines.

The Harrington Ring & Traveller Company, Boston, Mass., has been incorporated under Massachusetts laws with authorized capital stock of $1,000,000, to manufacture spinning rings and other appliances for cotton machinery, which are now manufactured in Manchester, England. It is the plan of the new corporation to establish a factory in some place in the United States, but the location is not yet determined upon. The officers of the company are: President, John Newell; treasurer, Edgar W. Wyman, and clerk, James A. Tigue, all of Boston. The present address of the company is care Vahey, Innes & Mansfield, 18 Tremont street, Boston.

The Arlington Mills, textile manufacturer, Arlington, Mass., is making extensive additions to its power plant, in connection with important enlargements already mentioned in *The Iron Age*. A 2000-kw. General Electric steam turbine and generator have been ordered, and the plan is to eventually add other large units. Eight 500 horsepower boilers will be installed, as it will be necessary to provide steam for the new dye house, which will be 100 x 324 feet and four stories. Other enlargements are a weave shed, 200 x 600 feet and two stories, and a one-story building, 375 feet square.

Chicago Machinery Market.

CHICAGO, ILL., June 13, 1905.

Current business in machine tools has been very light during the past week, aside from two or three rather large deals, which are being figured on, one at least of which will have been closed before this introduction is read. The machinery trades are not at all discommoded by the teamsters' strike and are able to make immediate delivery from stock, as the teaming interests associated with rigging and hauling machines are still steadily at work, no strike having been declared against the machinery houses by the Teamsters' Union. The strike does not interrupt business, travel or convenience of the citizens of Chicago, and offers no obstacles to visitors to the city. The Illinois Central, the Chicago & Alton, the Chicago, Burlington & Quincy, the Rock Island and other railroads that have received bids on rather large machinery requirements have not yet closed these requirements as far as can be learned, and are still waiting for necessary appropriations from their boards of directors. Illinois Central is expected to close this week or next.

Missouri Pacific Shops at Sedalia.

One of the largest industrial operations of this spring and summer is the erection and completion of the new shops of the Missouri Pacific Railroad at Sedalia, Mo. These shops are being erected and equipped at a cost of more than $1,500,000. They include the following buildings: Main machine and erecting shop, 130 x 750 feet; blacksmith shop, 100 x 244 feet; power house, 84 x 138 feet; paint shop, 120 x 312 feet; coach shop, 100 x 312 feet; planing mill, 80 x 268 feet; freight car repair shed, 70 x 401 feet; store house, 50 x 201 feet; oil house, 30 x 50 feet; paint store house, 40 x 60 feet; transfer table, 70 feet wide and 1200 feet long. The power for this plant will be furnished by five 343 horse-power Cahall horizontal water tube boilers furnished by the Aultman-Taylor Company. Four of these boilers will have Mansfield chain grate stokers. Power equipment will also include three 200-kw. Western Electric generators, direct connected to Murray Iron Works Corliss engines; one 100-kw. Western Electric generator, direct connected to Westinghouse engine; 23 motors, ranging in size from 3 to 60 kw., furnished by the Western Electric Company, which company also furnishes switchboards, wiring and electrical transmission equipment. Wm. Bayley & Sons Company, Milwaukee, Wis., have the contract for the fans and coils for the heating system, and the receiver for that company will carry out the contract. Fairbanks, Morse & Co. have been awarded the contract for two boiler feed pumps to furnish 60,000 gallons per hour and a fire pump of a capacity of 1500 gallons per minute. The Shaw Electric Crane Company has the contract for one 80-ton electric traveling crane. Compressed air will be used in the plant, the air being furnished by a Rand Imperial compressor of a capacity of 2000 cubic feet of free air per minute at 100 pounds pressure. Piping for the pneumatic system is underground, the contract for pipe having been awarded to the Universal Cast Iron Pipe Company, which will furnish its high pressure, flexible joint cast pipe. The Webster system of heating is to be installed, both direct heat and fans being installed. In the machine erecting and paint shops fans are used in order to provide a current that will facilitate the drying of paints and other coatings. Marsh vacuum pumps, Webster feed water heaters and Crane separators are to be installed. In the erecting and boiler shop provision is made for 34 locomotive stalls. The wood room will have an up to date system of shavings exhaust, contract for which has not yet been placed. A 100,000-gallon steel tank for water supply will also be erected. Large requirements in machine, metal and wood working tools for this plant are now being figured on, though many purchases were made last summer. It is expected by the railroad authorities that this great plant will be ready for occupancy the coming fall. The Arnold Company, Marquette Building, Chicago, has charge of the power, electrical and transmission features of the plant.

The Indiana Harbor Railway will soon be a purchaser of machinery equipment for railway shops along its right of way. This road extends from the Danville coal regions in Illinois to Indiana Harbor, Ind., a distance of 117 miles.

Machinery Requirements.

The largest single equipment being figured on by machine tool builders is that for the new plant of the Chalmers-Williams Company, which is to be erected at Chicago Heights. The machinery requirements for this plant will aggregate about $50,000. Contracts for most of the machines have already been entered into verbally and most of them will be formally closed during the week of this issue. Reference to the plans of this company is made in another column of this issue.

The Kennicott Water Softener Company has taken figures on a complete boiler shop equipment and a number of other tools to be used in its new plant to be erected at Chicago Heights, to which will be moved the machinery and the equipment of its old plant on Thirty-fifth street, Chicago.

The Morden Frog & Crossing Works is about to move its plant from South Chicago to Chicago Heights, where a factory covering 12 or 13 acres of ground will be erected and equipped. As this is double the size of the present plant large power and machinery requirements are being figured on by the machinery trades, but as far as can be learned nothing has been closed as yet.

The National Brick Company, 84 La Salle street, Chicago, has purchased 80 acres of land at Chicago Heights, Ill., where it will erect one of the largest and most modern brick plants in the country. Machinery and power requirement for this plant are already being figured on, but it is understood that no contracts have yet been placed.

The manual training shop which the Northern Normal and Industrial School, Aberdeen, S. D., is erecting, will call for the following equipment: Benches for wood work, wood working tools, band saw, combination saw, wood working lathes, benches for metal works, metal bench tools, hand lathes and forges. H. W. Mansfield is director of Manual Arts Department.

The Fisher Machine Works, Leavenworth, Kan., whose plant was recently damaged by fire, is preparing plans for a machine shop, 90 x 100 feet, and a foundry, 80 x 96 feet, and as soon as plans are perfected will be in the market for structural iron work for these buildings. The company has placed an order for two electrically driven traveling cranes.

J. F. Smith, vice-president and general manager of the International Asphalt Company, Mexico City, Mexico, intends purchasing equipment for two complete asphalt paving plants, consisting of sand dryers, elevators, mixers, engines, boilers and all small parts necessary. One of the plants will have a capacity of 1000 cubic yards and the other about 800 cubic yards per day. Mr. Smith is connected with the Mexican Engineering & Construction Company, Mexico City, which company holds the contract for paving all the streets of Veracruz, Mexico, amounting to $1,500,000. The large plant to be constructed is for this work. The small one will be set up in Mexico City, where the International Company holds large contracts.

Power Plants.

The Grand River Power Company, of which C. N. Haskell, Muskogee, I. T., is president, proposes to develop about 7500 horse-power on the Grand River about 12 miles north of Muskogee, the current to be transmitted to Muskogee and Ft. Gibson. This will be the first development of power of Grand River, and it is looked upon as a successful venture, as the city of Muskogee is rapidly becoming a manufacturing center. Excellent opportunities are provided for a suburban line to Ft. Gibson, 6 miles distant, in addition to the local street railway system, which has just been completed, as well as for large power requirement on the part of the railroad shops and a variety of manufacturing

establishments. H. von Schon, Detroit, Mich., is consulting engineer for the project.

The Shoshone Power Company, with offices in the Templeton Building, Salt Lake City, Utah, is just preparing for the contruction of two large plants at Shoshone Falls and at Auger Falls, on the Snake River, Idaho. It is proposed to generate about 65,000 horse-power. The officers of the company are as follows: Francis M. Lyman, president; John A. Bagley, vice-president and general attorney; Lyman R. Martineau, secretary and treasurer; Francis M. Lyman, Jr., manager and engineer. Details of the project are not yet obtainable.

The city clerk, Manistique, Mich., is advertising for bids to close June 22 on the following machinery and materials for a system of water works: One triplex pump of 750,000 gallons capacity and one of 500,000 gallons capacity, one 50 horse-power producer gas engine connected to the larger pump and one of 35 horse-power to the 500,000-gallon pump, 7 miles of cast iron mains, with hydrants, valves, &c.; steel stand pipe, 15 feet in diameter and 65 feet high. Alternate bids will also be taken on a 50 horse-power and a 35 horse-power electric motor, to be used instead of the gas engines. The proposals also include the erection of a brick power house, 37 x 45 feet, and a 50 horse-power producer gas plant. George W. Sturtevant, Fisher Building, Chicago, is consulting engineer, and John I. Jennings, Manistique, Mich., city clerk.

Philadelphia Machinery Market.

PHILADELPHIA, PA., June 13, 1905.

There has been no notable change of conditions in the Philadelphia machinery market during the past week. A careful canvass of the trade brings out no new features of the business, which continues, however, more or less active. Buyers actually in need of tools place their business without any great hesitancy, but there is quite a large volume of business on which bids have already been submitted which is still being held up.

The amount of building both under way and in contemplation can scarcely fail to bring out some good buying of tools or machinery for equipment before a great while. Most of the new work recently begun is in the nature of additions to new plants; in a number of instances power equipment alone is required, while others are making extensions to give needed room to present crowded conditions of their shops, and in such cases neither additional tools nor machinery will be required.

The textile machinery trade is showing some improvement and additions are being made to plants by some manufacturers of that class of machinery. Several large plants for the manufacture of textile goods are building and additions are being made to others, indicating an increased future demand for machinery of that type.

The boiler and engine trade does not appear to move as rapidly as might be desired. The competition in this field is extensive, and while some complaint as to present conditions is heard at times, there will no doubt be enough business develop to satisfy both dealers and manufacturers.

The builders of machine tools of the heavier type, special tools, &c., continue fairly active. Some of the manufacturers of these lines have taken on a good volume of business; so much, in fact, as to make early deliveries hard to obtain. The general run of standard tools, however, can be had fairly prompt, both from dealers and manufacturers. The market on the whole, and particularly considering the season of the year, holds its own remarkably well, it is said, and while a number of manufacturers could handle more business without difficulty, there is but little dissatisfaction with present conditions.

The foundry trades are, if anything, a little more active. The demand for steel and the better class of gray iron castings has increased, but the general jobbing foundries, as a rule, have not noticed any marked improvement.

The Newton Machine Tool Company has just bought nearly three-quarters of the block adjoining its plant and will shortly wreck the buildings at present occupying the site and erect thereon a machine shop and power house. The buildings will be of brick, two stories high. The dimensions of the property just secured are 108 x 266 feet, and when the new shops are erected, the increased facilities will enable the company to add to its output quite materially, the necessity for which has been felt for some time. During the past week quite a number of desirable orders have been closed, among which are a large duplex milling machine and seven smaller milling machines for the Western Electric Company; cold saw cutting off machine for the Canadian Bridge Company, Walkerville, Ont.; keyseat milling machine for the Philadelphia Traction Company; four-spindle boring machines for the General Electric Company, as well as a large number of smaller machines, which were well distributed throughout the country.

The Philadelphia Textile Machinery Company is building a third and fourth story addition, 47 x 133 feet, to its plant at Somerset and Palethorp streets. The company will, however, require no new equipment for the addition as much of the machinery now in use in various other parts of the plant will be transferred to the new floors when completed.

The Philadelphia Rapid Transit Company has filed plans for a new power house with the Bureau of Building Inspection of this city. The building is to be located at Delaware avenue and Beach street, where the company already has an extensive plant. The addition will be 175 x 200 feet in ground plan and average 100 feet in hight.

The Phillips Pressed Steel Pulley Works reports a very satisfactory business. There has been an exceedingly good domestic demand and foreign inquiry is increasing steadily. This company will shortly enlarge its plant, so as to enable it to double the present output as well as increase the size of present line of pulleys.

The Standard Pressed Steel Company has shipped a large consignment of American Pioneer steel hangers to Honolulu, Sandwich Islands, and made smaller shipments for export to Germany and other countries. The demand for these hangers, it advises us, is constantly improving, and its plant has been continuously busy. There is a good local demand for hangers for plant equipment, and deliveries are being made on orders from all parts of the country. The company has also recently shipped a number of hangers for exhibition purposes at the coming Master Car Builders' Convention at Manhattan Beach, New York.

Wickes Bros., through their local branch in the Philadelphia Bourse, report a satisfactory condition of business. The demand for engines, boilers and air compressors has been good and some very good projects are in sight. They have recently closed for a large mine hoist for delivery to one of the anthracite coal companies.

I. H. Johnson, Jr., & Co., Incorporated, continue quite busy. There has been considerable inquiry for lathes, and bids have been made on a number of good propositions. Orders recently have been coming in quite satisfactorily and a number of tools have been delivered various purchasers, one delivery during the past week consisting of a carload of tools for Western delivery.

The Espen-Lucas Machine Works notes an improved demand for both cold saw and other machinery. Inquiries have increased, as have also orders during the past few weeks, including among others several for horizontal floor boring, milling and drilling machines. Recent deliveries by this company includes several large bar saws for Southern delivery, a bar and an I-beam saw for New York parties and cold saws and grinding machines for parties in the Central West.

Dienelt & Eisenhardt, Incorporated, have received orders for a number of Lovekin tube expanding machines of the A B and C types and for hydro extractors. They also advise us that a number of orders are being received from the various railroads for hydraulic jacks. A good business is being done in their new line of Monarch electric motors, and all departments of their plant keep exceptionally busy.

The Hess Bright Mfg. Company, maker of ball bearings, 247 North Broad street, is having a very good demand for its bearings, particularly for automobile, electric motor and generator, power transmission and general machinery purposes. Its new plant is actively engaged on bearings for all purposes.

Edw. W. Morris and E. J. Miller, trading as Morris, Miller & Co., have purchased the interest of Lovegrove & Co., Incorporated, in this company's recently established branch store at 716 Arch street, Philadelphia. Morris, Miller & Co. will represent the Ohio Gas Engine Company, manufacturer of gas engines, and the National Engine Company, Saginaw, Mich., manufacturer of pumping engines, in this territory, handling as well a complete line of boilers, engines, pumps, heaters, &c.

The American Steel & Wire Company publishes a pamphlet of 19 pages entitled "A Treatise on the Use of Sulphate of Iron and Copper in Water Purification." Sulphate of iron is a by-product of the acid tanks of wire mills. In April of this year the American Steel & Wire Company furnished enough sulphate of iron for a ten-day test of that chemical as a coagulant in connection with the operation of the city water filtration plant of Anderson, Ind. The test was conducted by the Bureau of Plant Industry of the Department of Agriculture and the report of the bureau is given in the present pamphlet. Iron sulphate containing 1 per cent. copper sulphate was used, and the conclusion of the experts is that the filtering of polluted water through the layer of coagulum of iron and copper which forms on the filter bed brings the bacteria borne in the water into contact with the precipitated copper for a sufficient length of time to destroy the colon bacillus and thus remove all danger of typhoid. It is stated that appreciable amounts of copper cannot reach the consumer. The copper is all precipitated and the insoluble coagulum of iron and copper is caught upon the filters.

Cincinnati Machinery Market.

CINCINNATI, OHIO, June 13, 1905.

Conditions continue favorable, and all the plants are about as busy as they desire. This means a great deal, when we stop to consider the fact that many of them have doubled their capacity over that a year or two ago. Foreign demand has greatly increased during the month, and is a very important factor in the situation. With peace apparently in sight, it is logical to predict that the combatants will now turn their attention to manufacturing and seek the machinery and tools best suited to their needs. One of these countries, at least, is very favorably disposed toward our people and as in the past have backed their opinions by their purchases, it is reasonable to suppose that this condition of friendliness will continue to exist, and our markets be sought for supplies. The other party, it is hoped under a changed condition of affairs, with a more liberal spirit being developed, will so modify the high duty now prevailing, as to permit our machine tool builders to at least have equal recognition with those of other lands. Several large size requisitions for railroads have been placed, a portion of which was secured by builders in this city.

The Cincinnati Electric Tool Company will remove from its present quarters at 2125 Coleman street to Evans street, south of Eighth, where it has secured ground and has plans fully matured for the erection of a two-story brick building, 50 x 100 feet, thereby giving it about 10,000 square feet of floor space. This will enable the company to increase its output four times over present conditions. It will build a shop modern in all particulars and hopes to get possession some time this fall. The company will bring out a number of new devices that are now in contemplation, which was inexpedient under present conditions. A portion of the present equipment will be installed in the new plant, and this will be increased by the addition of new tools in the way of lathes, planers and electric equipment.

The Bickford Drill & Tool Company says it received orders for a portion of the new tools recently ordered by the Erie Railroad, and also by the General Electric Company. The company has just installed two more electric travelers and is now figuring on some additional room for its plant. Trade is reported to be in excellent condition.

The American Tool Works Company says that trade both foreign and domestic is in a very satisfactory condition, although there appears to be a slight falling off in orders over a month ago. This is not considered as being of special import, as fluctuations are to be expected.

Some weeks since we made mention of the fact that the Hamilton Machine Tool Company had purchased the plant of the Belmer Machine Tool Company of this city. The name of this concern has been changed to that of the first mentioned and a fair condition of trade is reported. Several new buildings are now under construction at the Hamilton plant, which when completed will receive the machinery of the former Belmer plant. This addition, which is now completed as far as the second floor, will consist of a main building 100 x 200 feet and will be used as an erecting shop. This building will be one and two stories in hight and of brick construction. A 20-ton electric traveling crane will traverse the length of the building. The boiler building will be 40 x 60 feet and will be equipped with a new 200 horsepower tubular boiler, which will make a total boiler equipment of three. The engine now in use, which is a large Hamilton Corliss, will be utilized and will be sufficiently large to carry the load. An addition, 40 x 80 feet, will also be made to the present pattern storage house, which will be fire proof in all particulars. The company expects to occupy these new buildings not later than September 1. When completed and the tools are all rearranged it will manufacture a complete line of the following tools: Lathes, from 14 to 36 inches, with several other sizes to be added later; planers, 30 to 96 inches, to which will be added a 24-inch; shapers, from 16 to 28 inches; radials, from 2½ to 5 feet; upright drills, from 12 to 42 inches. In this rearrangement of tools it will probably be necessary to secure additional tools, which will be fully determined as soon as possible. The company reports that it has been compelled to cancel a number of orders on account of not having enough floor space to properly take care of them and make required deliveries. May is said to have been the largest month in years, not so much from a spasmodic view as from the even tenor with which new business has come forward and satisfactorily adjusted itself.

The Bentel & Margedant Company, Hamilton, is building a one-story addition to its plant, 95 x 100 feet, and is preparing wareroom facilities for exhibition of stock. This will increase the capacity of the shop very materially and allow the company to add a number of new tools, which is being done at short intervals. Business is said to be first class, with a large percentage foreign in character. It has now ready for shipment one of the widest wood planers made, 60 inches, for Cologne, Germany.

The Long & Allstatter Company, Hamilton, is figuring on erecting a new power house directly across the street from the present plant. Estimates are now being prepared for this building, and pipes connecting the present plant with the proposed new addition have been laid in anticipation of this movement. The present space occupied for boiler and engine purposes will then be devoted to increasing the facilities of the plant. A larger engine and boilers will be necessary, and these will be added when the change is made. A new electric generator will also be required. The company reports several export orders as having been received, also one from the American Car & Foundry Company for its Madison, Ill., plant for punches, coping machines and large gate shear.

The Niles Tool Works Company has had in contemplation for a long time the addition of a foundry building, which has been held up by the City Councils refusing to allow Second street, directly in the rear of the plant, to be condemned. The company now advises that matters appear to be in a fair way of settlement and that it will be enabled to expand as it wishes. This contemplated foundry building will be 250 x 500 feet on Second street and be a modern, up to date plant in every particular. This will give the company double the capacity of the present foundry, which will be turned into a machine shop and will necessitate the addition of a number of new tools. It advises that the tendency is toward heavier and more powerful tools, and that it has found it necessary to remodel many of its tools in the last few years to bring them up to the standard weight.

The Black-Clawson Company, Hamilton, has let the contract for the raising of the roof of the north machine shop, which building is 45 x 200 feet to 60 feet. It will add a 12-ton electric traveling crane and rearrange present tools in a more advantageous manner. Some of these will be driven individually and others in gangs. New tools will be added in the shape of lathes, radial drills, shapers, boring mill and grinder. Trade is said to be excellent.

The Hooven, Owens, Rentschler Company says that it is fairly busy only. This comparison is made on the basis that the present shop is several times the capacity of the old plant, and what would have been considered a crowded condition at that time under present conditions appears to be a fair amount of business only. The company is building three large vertical engines, 2500 horse-power each for the electric light station at New Orleans.

Cleveland Machinery Market.

CLEVELAND, OHIO, June 13, 1905.

Cleveland machinery dealers say there has been a decided improvement in business during the past two weeks. Few large orders for equipment have been taken, but the volume of business due to numerous orders for a tool or two here and there are most satisfactory.

The Warner & Swasey Company, Cleveland, manufacturer of machine tools, has experienced a pronounced improvement in business during the past year or two and finds it necessary to largely increase its facilities. It is planning for a large additional building and will make other changes and improvements during the next few months.

The Pope Motor Car Company, Toledo, is preparing to erect a new building, 50 x 220 feet, and four stories high. This will be used for wood working and finishing departments and the present finishing shop will be fitted up for machine shop, for which additional machinery will be purchased. The company recently ordered several milling machines. The improvements are to be ready by September 1, when work on next season's output starts.

The Blondell Steel Company, Cambridge, has succeeded to the plant and business of the Cambridge Rolling Mill Company. A number of improvements to the plant are under way and others are contemplated, including the installation of considerable new machinery, and a new furnace will probably be erected. The present capacity is 40 tons single turn, and the company expects to put it in position to turn out 100 tons double turn. The new company is making a specialty of railroad spikes, harrow teeth, special shapes for vehicles, agricultural implements, &c., also Bessemer steel angles and bars in all shapes.

The Pennsylvania Railroad Company is planning to erect a pumping station on Big Walnut Creek, near Columbus, which will supply the shops and terminals of the road at Columbus. The company also has under consideration the erection of a large water purifying system at Columbus. D J. Durrell, assistant superintendent of motive power, Columbus, has prepared plans for the improvements.

The Twentieth Century Heating & Ventilating Company, Akron, Ohio, will shortly commence the manufacture of steam and hot water heaters of all sizes. W. S. Roath, formerly with the J. H. McLain Company, Canton, will have charge of the department. A large factory addition will be erected to take care of the new department.

The Grant Fence Company has been organized at Ashtabula, and will operate automatic fence machines built by the Buckeye Fence Machine Company, Ashtabula. W. C. Grant is president and general manager, and B. F. Powers, Cleveland, vice-president.

The Board of Public Service of Toledo is sending out specifications for a mechanical filtering and water purifying

plant. The specifications provide for either gas or steam engines. Contracts will be let soon after June 30.

The Roberts & Abbott Company, Cleveland, consulting engineer for the Washington, Baltimore & Annapolis Railway, is preparing plans for the power station equipment. The road will run from Washington to Baltimore and will be one of the most important high speed electric roads in the country.

The Dean Electric Company, Elyria, Ohio, manufacturer of telephone apparatus, has placed the contract for the erection of a large addition.

The Lorain Sheet Metal & Cornice Company, Lorain, has purchased a site and will erect a factory for the manufacture of patent sheet metal cornice.

The Aultman Engine & Thresher Company, Canton, which was recently reorganized by the creditors, is now operating its plant, running full time. Gordon M. Mather, secretary of the Cleveland Axle Company, has become general manager of the company, resigning his former position June 15.

The Board of Public Service of Cleveland is offering for sale the old equipment of the Fairmount water works pumping station, consisting of two 5,000,000-gallon Cornish pumping engines and six Cornish boilers. These engines have been in continuous service in the Cleveland water works since 1854 and they are said to be in first-class condition, notwithstanding this remarkable record.

The Cleveland Machinery & Mfg. Company, Cleveland, which does heavy jobbing work of all kinds, states that it is busier than ever before. It recently shipped a large rolling mill outfit, with a 107-foot table, to the Eastern Steel Company, Pottsville, Pa., and a number of large tack machines to the American Steel & Wire Company. It has just added to its equipment a 48-inch x 22-foot Pond engine lathe. An unusual feature of this machine is that all gears and pinions were made from steel forgings, which the company produced in its own shop to secure strength and durability.

The Lucas Machine Tool Company, Cleveland, is experiencing a very pleasing demand for its horizontal boring mills, special tools which answer unusual requirements. The company has recently added some new machinery to its equipment, including a traveling crane in its erecting shop.

The C. O. Bartlett & Snow Company, Cleveland, has recovered from its recent fire and is now working a double turn. It is experiencing an unprecedented demand for dryers and cement machinery. It recently shipped large outfits to the Montana Zink Company, Butte, Mont.; Blake Mining & Milling Company, Denver; Henrietta Cyanide Mining & Milling Company, Semi-Steel Company and the Iroquois Portland Cement Company.

Government Purchases.

WASHINGTON, D. C., June 13, 1905.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until June 27 for a quantity of supplies for the Portsmouth, Newport, New York, League Island, Washington, Annapolis and Indian Head navy yards as follows: Schedule 301—motors, generating sets, lathes, grinder, presses, boring mill and milling machines; schedule 302—generators, pipe cutting machines, tools, steam engines; schedule 303—forges, hydraulic jacks, lathes, drill, shaper, jointer, wood trimmer, grinder, drill press, metal saw, blower; schedule 305—hydraulic jacks, forges, drills and miscellaneous tools.

Proposals will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, until June 27 for a quantity of supplies for the Mare Island and Puget Sound navy yards, including schedule 285—crane, motor, radial drills, &c.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until June 27 for the following supplies for the Pensacola, Key West and New Orleans naval stations: Schedule 298—combined blower and exhauster and bending rolls.

Bids will soon be asked by the Isthmian Canal Commission for two double cylinder double friction drum hoisting engines, two pile driving hammers of about 4000 to 5000 pounds, six 10-ton hydraulic jacks, four No. 8 locomotive jacks, two 2,500,000-gallon duplex steam pumps, &c.

The following bids were opened June 6 for machinery for the Portsmouth, Boston, Norfolk and League Island navy yards:

Bidder 12. Eli H. Allen, Boston, Mass.
13. Allington & Curtis Mfg. Company, Saginaw, Mich.
27. Baird Machinery Company, Pittsburgh, Pa.
33. Bridgeport Safety Emery Wheel Company, Bridgeport, Conn.
34. Becker-Brainard Milling Machine Company, Hyde Park, Mass.
36. Burke Electric Company, Erie, Pa.
39. E. W. Bliss Company, Brooklyn, N. Y.
40. Brown & Sharpe Mfg. Company, Providence, R. I.
45. C. & C. Electric Company, New York.
46. J. W. Cregar Agency, Philadelphia, Pa.
47. Crocker-Wheeler Company, Ampere, N. J.
52. Case Mfg. Company, Columbus, Ohio.
54. Cleveland Crane & Car Company, Wickliffe, Ohio.
59. Chandler & Farquhar Company, Boston, Mass.
68. Drew Machinery Agency, Manchester, N. H.
80. Erie Foundry Company, Erie, Pa.
88. Walter H. Foster Company, New York.
93. Franklin Portable Crane & Hoist Company, Franklin, Pa.
94. R. W. Geldart, New York.
102. General Electric Company, Schenectady, N. Y.
104. Hisey-Wolf Machine Company, New York.
118. Hill, Clarke & Co., Boston, Mass.
120. Hendey Machine Company, Torrington, Conn.
121. Holyoke Belting Company, Holyoke, Mass.
123. Handlan-Buck Mfg. Company, St. Louis, Mo.
143. Manhattan Supply Company, New York.
146. Morgan Engineering Company, Alliance, Ohio.
154. Manning, Maxwell & Moore, New York.
165. Niles-Bement-Pond Company, New York.
180. Prentiss Tool & Supply Company, New York.
189. S. M. Price Machinery Company, Norfolk, Va.
200. Pettingill-Andrews Company, Boston, Mass.
203. Royce & Ricketts, Washington, D. C.
204. John B. Roache, Brooklyn, N. Y.
217. Pawling & Harnischfeger, Milwaukee, Wis.
229. Sprague Electric Company, Philadelphia, Pa.
231. Sherman-Brown-Clements Company, New York.
233. Wm. Sellers & Co., Incorporated, Philadelphia, Pa.
234. Springfield Mfg. Company, Bridgeport, Conn.
235. Smith-Courtney Company, Richmond, Va.
237. Sterling Blower & Pipe Mfg. Company, New York.
247. Thresher Electric Company, Dayton, Ohio.
258. Wellman-Seaver-Morgan Company, Cleveland, Ohio.
259. Whiting Foundry Equipment Company, Harvey, Ill.
266. Westinghouse Electric & Mfg. Company, Baltimore, Md.
274. Waterbury Brass Company, Waterbury, Conn.

Schedule No. 244.

Class 1. One 2500-pound steam drop hammer—Bidder 80, $2106.57; 146, $2335; 165, $2260, $2645 and $2835; 235, $2660.

Class 2. One No. 76½ Bliss geared trimming press—Bidder 39, $3050; 94, $3155; 154, $3130; 189, $3075.

Class 3. For installing complete a slow speed low pressure dust and shaving collecting system for saw mill—Bidder 12, $1800; 13, $1500; 237, $1796.

Schedule No. 245.

Class 11. Four portable electrically driven grinders and one portable electrically driven radial drill—Bidder 27, informal, bid on part of class; 46, $291.25; 104, $333; 118, informal; 154, $333; 231, $333.

Class 12. One electric traveling crane—Bidder 52, $7875, 54, $7250; 146, $7195; 154, $7478; 165, $7600 and $7000; 217, $7500; 258, $9300; 259, $8900.

Class 13. One horizontal boring and drilling machine—Bidder 46, $1645; 88, $2550; 154, $2490; 165, $2250; 180, $2050.

Class 14. One 6½-inch universal radial drilling machine—Bidder 46, $1250; 154, $1225 and $1300; 165, $2290, $1625 and $1840; 180, $1625; 203, $1250.

Class 15. One 48-inch radial drill—Bidder 27, $649; 46, $635; 59, $761.75 and $846.75; 68, $697; 123, $575; 154, $620; 165, $1090; 180, $595; 203, $650; 204, $555.

Class 16. One 30-inch upright drill—Bidder 27, $789; 46, $945; 118, $777; 154, $900; 165, $690; 180, $1014; 203, $825.

Class 17. One 25 x 25 inch x 6-foot planer—Bidder 46, $498, $565 and $667; 59, $678.75; 154, $578 and $650; 165, $680 and $1070; 180, $650; 233, $895.

Class 18. One 30 x 30 inch x 8-foot planer—Bidder 46, $1160; 59, $1285.50; 118, $1235; 154, $1075 and $910; 165, $1280 and $1320; 180, $910; 233, $1280.

Class 19. One 20-inch friction clutch driven pillar shaper—Bidder 120, $358; 154, $357; 165, $420.

Class 20. One 24-inch universal shaping machine—Bidder 88, 682; 120, $515; 154, $515 and $495; 165, $560; 180, $617; 203, $557.50.

Class 21. One 28-inch shaper—Bidder 46, $450; 120, $685; 154, $837 and $685; 165, $595; 180, $758.

Class 22. One plain grinding machine—Bidder 88, $4270.

Class 23. One universal grinding machine—Bidder 40, $710.50; 88, $710.

Class 24. One surface grinding machine—Bidder 40, $731.50; 234, $550 and $600.

Class 25. Four wet tool grinders—Bidder 27, $224; 33, $272; 46, $220; 118, $200; 123, $204; 154, $212; 180, $340; 234, $300.

Class 26. One drill grinder—Bidder 154, $113; 233, $210.

Class 27. One overhanging polishing and buffing machine—Bidder 27, $44.75; 33, $52.75; 154, $47 and $40; 234, $65.

Class 28. One double belt polishing machine—Bidder 27, $167; 46, $170; 154, $162.

Class 29. One universal milling machine—Bidder 34,

$910; 40, $959.75; 118, $725; 121, $965; 154, $963; 165, $925; 180, $975.

Class 30. One universal milling machine—Bidder 34, $1200 and $1000; 40, $1257.25 and $1272.25; 165, $1150; 180, $1226.

Class 31. One duplex milling machine—Bidder 46, $650; 118, $900; 165, $830 and $860.

Class 32. One metal cutting band saw—Bidder 27, $155; 123, $162; 154, $170.

Schedule No. 259.

Class 148. One rock crusher, one belt elevator, one revolving screen and one 12 horse-power motor, 110 volts—Bidder 9, $1666.83; 11, $890.65.

Schedule No. 260.

Class 151. Four 50 horse-power motors and ten 35 horse-power motors—Bidder 47, $8566; 102, $7084; 203, $11,160; 229, $7722; 247, $6500; 266, $8014.

Schedule No. 262.

Class 211. Two electric motors—Bidder 36, $825.60; 45, $751.25; 47, $906, $1020, $928.50 and $1044.50; 102, $790; 203, $1160; 229, $986; 247, $710; 266, $885; 274, $756.

Class 213. One portable crane and hoist—Bidder 93, $7278.

Class 214. Cutter wheels, feed pump, extension pieces and nuts, &c.—Bidder 143, $63.86.

The following awards have been made for machine tools for the various navy yards, bids on which were opened May 23:

Manning, Maxwell & Moore, New York, class 35, one multiple 8-spindle high speed drill, $1350; class 36, one hand and power upright post drill, $49; class 38, one arbor press, complete, $105; class 51, one set plate straightening electric driven rolls, $1415.

Niles-Bement-Pond Company, New York, class 21, one 24-inch motor driven engine lathe, $1025; class 46, one motor driven double punch, $740.

Smith-Courtney Company, Richmond, Va., class 32, one electric emery grinder, $144.97; class 34, one portable electric center grinder, $56.

Montgomery & Co., New York, class 39, two arbor presses, $100.

Geo. A. Ohl & Co., Newark, N. J., class 47, one hand gap punch, $85; class 49, one heavy rotary shear, motor driven, $750.

H. A. Rogers Company, New York, class 52, one 40-ton hydraulic stanchion pipe bender, $297.

Oliver Machinery Company, Grand Rapids, Mich., class 54, one disk sanding machine, complete, $215.

S. A. Woods Machine Company, South Boston, Mass., class 58, one medium size hollow chisel mortising machine, motor driven, $1100.

Prentice Tool & Supply Company, New York, class 66, one horizontal boring and drilling machine, $3095.

Vandyck-Churchill Company, New York, class 67, one automatic saw grinding machine, $165; class 68, one cold metal sawing machine, $1068.

Edward J. Etting, Philadelphia, Pa., class 69, two foundry cupolas, $2120.

Handlan-Buck Mfg. Company, St. Louis, Mo., class 161, one screw cutting extension gap lathe, one pillar shaper, one combined punch and shears and one vertical crank steam engine, $2144.

Class 31, one grinding machine, for grinding edges of air port glass will be purchased in open market, and class 44, one 1200-pound double frame steam drop hammer, has been canceled.

The Navy Department has decided to award contracts for guns and mounts for the battle ship New Hampshire and the armored cruisers North Carolina and Montana, as follows:

Bethlehem Steel Company, South Bethlehem, Pa., four 12-inch guns at $51,644 each, and eight 8-inch mounts at $19,990 each.

Midvale Steel Company, Philadelphia, Pa., 32 6-inch guns at $12,860 each; 12 7-inch guns at $14,355 each, eight 8-inch guns at $17,142 each, and 33 6-inch mounts at $7588 each.

In May the open hearth plant of the La Belle Iron Works at Steubenville, Ohio, containing 12 50-ton open hearth furnaces, turned out over 30,000 gross tons of steel. Furnace No. 7 made a record breaking run ending May 31, when it made a total of 501 heats on the original bottom, bringing the total output of this furnace on one bottom to 27,557 tons. This is the record for open hearth practice to date, furnace No. 13 at the Homestead Steel Works of the Carnegie Steel Company heretofore holding the record with 26,700 tons. In number of heats the Homestead furnace is still in the lead, with 702 to its credit, having operated for 12 months without change of bottom.

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HARDWARE.

MUCH space in this issue is devoted to a report of the deliberations and proceedings of the two conventions which met last week at Hot Springs, Va. The topics to which such prominent consideration was given are of interest not only to the associations whose meetings were the occasion of their discussion but to the trade at large and to every Hardware merchant and manufacturer. The wide diversity of subjects thus canvassed is indeed suggestive, ranging as they do from questions of national and international significance to those relating to the details of business of major or minor importance. Subjects which command the attention of statesmen and will come up for decision by Congress were thus coupled with the simpler though sometimes perplexing problems of commercial life. and relating to the routine of daily duty. A most interesting variety of topics was thus brought to the attention of one or other of the conventions, illustrating the wide information and breadth of view as well as the painstaking care of commonplace things which must be found in the up to date business man of to-day. In connection with the necessary drudgery and detail of business there is, for example, to be the intelligent consideration of questions which engage the thought of statesmen and legislatures, such as tariffs, international relations and the Governmental control in one form or another of railroads and their charges. The changes which are taking place within the trade, the constant advance in business methods and practices all along the line and the great questions of national importance which can only be determined after protracted public discussion all unite to dignify the calling of the merchant and manufacturer and to make the life of business men in any field interesting and even fascinating. Of this the conventions just adjourned furnish a striking illustration. If those who attended them did not return to their tasks taking a broader outlook and with new enthusiasm they missed their opportunity and failed to get into touch with the spirit of a notable gathering.

Some of the subjects which engaged the attention of the delegates at the recent conventions were thus of interest as concerning matters which relate to business in general and not simply in the Hardware field. Questions in regard to special or jobbers' brands are, however, of principal importance to the Hardware trade, and the action taken by the manufacturers was especially significant. The resolutions adopted on this subject and communicated officially to the Jobbers' Association indicate a determination on the part of the manufacturers to do something to protect themselves and the trade against the evils which have gradually developed in the marketing of goods under the brands of their customers and without their own. To such an extent is this carried in certain lines that manufacturers who naturally take pride in their products find that only a small percentage of the goods they make go out in connection with their names, so that there is no opportunity for them to make a reputation for their trademarks, which should be so valuable an asset in a manufacturing business. It is evident that this practice has gone so far that they realize that something must be done, or at least attempted, to correct existing conditions. The resolutions adopted intimate that if the jobbers are not willing to act as the distributers of the manufacturers' goods it may be necessary to seek other channels. The jobbing trade naturally are desirous of continuing the selling of brands which they control, and are able to make more or less plausible reasons why they should do so. Without going at this time into the question as to the generally lower quality of special brands, or the conflict of interest between the manufacturers and jobbers in this matter, subjects which are sure to be discussed at length, we refer to the resolutions of the manufacturers and the reply of the jobbers presented in parallel columns on another page.

Condition of Trade.

The gradual relaxing of pressure in business matters is not an unwelcome incident at this time, when the trade is beginning to feel the quieting influence of the summer months and of the approaching vacation period. While the volume of current business continues fair it is not heavy, but opportunity is thus afforded those in charge of factory or store to get things into shape for future business and at the same time to enjoy something of a breathing spell. In this connection the reports of the Hot Springs conventions will be of interest as representing the thought of the trade in regard to a variety of important matters and touching upon some of the problems which await settlement. Meanwhile, notwithstanding the softening in the market, which naturally induces caution in purchasing, merchants are buying such goods as they need, realizing that any possible slight reductions in price should not deter them from keeping their stocks up to a good working level. Trade accordingly continues to move along on normal lines, with a feeling of confidence and the anticipation of good business in the fall. The situation certainly, as more fully reflected in the special reports which follow from our valued correspondents in the principal trade centers, is such as to call for congratulation and hopefulness as we approach the turning point of the year.

Chicago.

Every little rise of temperature brings an immediate response in demand for strictly hot weather goods, such as Ice Cream Freezers, Refrigerators, Awnings, Hammocks, while the moisture that has been prevailing for the last six or eight weeks in the West has brought to life such an unusual number of mosquitoes that the demand for Wire Cloth is exceptionally heavy. The same moist conditions have resulted in a record breaking sale of Lawn Mowers. Most jobbers have sold from 25 to 50 per cent. more than their annual spring sales already, and before the end of June look forward to a record of sales fully double the average. The great growth of the game of golf has also played a part in the demand for Lawn Mowers, particularly in the wide sizes for hand power and the special machines for horse-power and for Motors. Factories are behind their orders on horse-power Lawn Mowers, and are experiencing a surprisingly large demand for gasoline motor Mowers mainly from golf links and city parks. Demand for Nails is large, but purchases of Nails and Wire goods by jobbers and consumers last summer and fall for future delivery were so heavy that even the excellent consuming trade which has prevailed during 1905 has been insufficient to absorb the stocks and commitments. In this state of affairs the small manufacturer of Nails and Wire products is finding considerable difficulty in finding a market for his wares, and is being forced by the desire for tonnage and by financial considerations to shade prices considerably in order to secure immediate orders. This price cutting is mainly done, however, on carload lots for shipment from mill and is indulged in by only a few of the mills. Reports indicate that specifications and orders for Eaves Trough and Conductor Pipe on the new schedule are both plentiful and that the tone of the market is satisfactory, alike to both buyer and seller. Scythes, Snaths, Hay Forks and Steel Goods generally

are enjoying a trade equaled in no previous year. In fact, anything that is directly or indirectly connected with the hay crop or with the growth of grass is experiencing an excellent demand. Galvanized Sheets from store are somewhat demoralized by the overstocks in the hands of both jobbers and consumers and by the rapidly declining price of Spelter, which has a softening influence on mill prices.

In general June is looked upon as being a light month, just as December is, because it precedes the semiannual inventory and merchants are desirous of holding stocks down to the lowest possible point at inventory time. This influence is being felt, but as against it there are many price concessions made by producers for the purpose of inducing buyers to close for future delivery, a sentiment having begun to make itself felt that prices may be held more firmly after July 1 or may indeed be advanced in the fall on many lines.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—Many of the reports to *The Iron Age* will be tinctured with a flavor of warm magnesian water quaffed at the original fountain at Hot Springs, Va. This was a notable gathering in a most beautiful natural spot, which has been improved by the hand of man until it left nothing to be desired by the guests who went there from the 6th to the 8th, or a day or two longer at either or both ends as the case might be. The presence of distinguished public men —namely, Secretary Taft, Senator Carmack of Tennessee, Samuel Spencer, president of the Southern Railway—lent special interest to the meeting.

The manufacturers entertained on liberal, not to say lavish, scale, and the Reading Band discoursed music through the day and into the evening, while the dispensation of souvenirs was unstinted. There was some comment made on the fact that the jobbers' representation was not larger. The actual number of houses represented was between 30 and 40. Some of the companies thought it worth while to send several representatives. Others must have had good excuses for staying away, for there was everything tempting in the place, time and invitation. The best of feeling prevailed.

The question which received the most marked consideration probably was that of railroad rate regulation, which fell to the lot of Mr. Spencer and Secretary Taft to ventilate. To say that it was well done on both sides is unnecessary. Whatever either of these gentlemen says is apt to set us all thinking. One point, we believe, was finally settled—namely, that George Sargent vindicated his claims to be considered dean of the Hardware faculty. This claim had been disputed between Mr. Supplee and Mr. Bigelow, with a few odds on either, both of these gentlemen having gone in about the year 1855. Mr. Sargent pointed out the fact that he was born in the Hardware business and that he came to his majority therein at least three years before these other gentlemen. On an occasion like this it is a great time to have all disputed points of this kind cleared up.

Baltimore.

CARLIN & FULTON.—Business continues in a normal state, the demand for goods generally comparing favorably with that of last year. June is usually considered the dullest month of the 12, though there is always, especially in Agricultural Tools, considerable activity up to the time that the wheat harvest begins, which now is close at hand. Years ago during the extremely hot weather the trade had but little to sell, the demand being almost nothing between seasons, but the increased variety of goods that have been brought out adapted especially to the hot weather has made a change in business from absolute dullness prior to the fall season. The great demand for Lawn Mowers, Refrigerators, Ice Cream Freezers, Window Screens and Doors, and other goods of the same character, indicates a greatly improved condition of the average individual throughout the country in supplying himself with what were formerly considered only as luxuries, but now almost necessities.

This is the time that tests the stability of the prices of heavy staples, and there is considerable interest felt in the next meeting of the Wire Nail manufacturers, which we hear will take place this week. Any one who is inclined to pessimism should have an interview with the representative of a Wire Nail factory, whose views of the market are generally of such an optimistic character that the buyer can hardly ever feel that there should be a reduction in price. It is undoubtedly the case that the manufacturers have sustained prices for some time past more firmly than their customers have, and that the latter have been underselling the market; if we consider as the market agreements or prices quoted and published by the manufacturers. This happens in many cases through overtrading and lack of ability to carry the goods purchased, also lack of ability to market goods except at less than their value, but we do not know that the case will ever be different.

Collections have generally been good, and locally the bank clearings are largely in excess of those of a year ago, indicating increased business, and as stocks throughout the entire country are not extraordinarily heavy we look for a good business during the coming season.

Cleveland.

THE W. BINGHAM COMPANY.—Nature's guarantee to the farmers of an immense wheat crop all over our country presages a good business for us during the balance of the year, for when the farmer has good crops we are all prosperous. We all have reason to be thankful that we live in such a great and glorious country and that our resources are so varied and diversified that no matter what ill may befall in one section we are blessed with such abundance in other sections that our losses are neutralized.

A steady volume of orders is coming to this market through salesmen and direct by mail from our customers, and we shall round up our first six months' business this year with an excellent showing. There is no special demand for any particular articles or lines at the present time, but orders are well assorted, showing that the retail trade are having a steady, even business.

Frequent rains that have visited many sections of territory we cover have kept the lawns green and growing, so that the demand for Lawn Mowers has been unusually large. It would seem that the storms have spent their force and we are looking forward now to a warm, dry season, which will ripen the grain and make the corn grow, and when the great crop is harvested it will make us all feel happy and rich.

Jobbers here are fairly well stocked with Poultry Netting and Wire Cloth to meet the immediate wants of the dealer. Sales of these two lines of goods will far exceed any previous year's. Prices on these lines are low and customers are not afraid to sort up in liberal quantities. There is considerable activity in Galvanized Sheets, Roofing Plates, Merchant Pipe (steel and iron), Hand and Horse Hay Forks and Grain Cradles. Shovels of all kinds are in good demand, as there seems to be a great deal of work being done by trolley and steam railroads. On the whole trade at this time is quite satisfactory.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—Now that the business of the first half of the year is well along, it is suggestive of a brief *résumé* of the conditions that have existed during this period. In this time there have been unusually few disturbances and none of them of a serious character. Business has run along smoothly and very much as expected. The conditions as to weather and also in some other respects during January and February were somewhat unfavorable and sales fell behind. By March 1, however, they began to show up handsomely, and they have since kept up a very fair pace, and the year's business at this date compares favorably with preceding years. Owing to special causes there has been some falling off in a few lines of staple goods, but for the most part this is only temporary. Prices on the whole have been well maintained, and altogether the trade has been satisfactory.

We have now come to the season when interest centers largely in the condition of the crops and they and the weather are uppermost in public and private concern.

Thus far the conditions in the Northwest are favorable. The season has been cool and in some parts there has been excess of rain, but crop prospects have seldom been better, and with favorable weather the balance of this month and July we may expect an abundant harvest. It is to be hoped that the whole country may be favored with fair crops and that business may not suffer from depressed demand and especially from reduced prices. On the contrary, it now promises that business will be unusually active this fall and that very heavy demands will be made on the factories. Collections have generally been fairly good, with no more than the usual number of exceptions.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—This is right in the middle of the midsummer dull season and yet we are not dull here by any means. Business is keeping up splendidly, and orders are much more numerous than this time last year. This is probably accounted for in some measure by the very late spring, which has made trade, on the average, nearly a month later than usual. This, of course, helps out the midsummer dullness.

Conditions in the West, South and Southwest are lovely. Prospects! If we could live on prospects we would certainly be feasting very high now, but the realization is usually far from the anticipation.

Hay, corn, wheat and oats will no doubt make magnificent crops this year; some of them are already made and others are beyond the danger line. Cotton is the only problem. The Southern States, of course, are very much interested in that product. Still they are breaking away from it to a large degree. The recent magnificent results from irrigation in the raising of vegetables in the region of Brownsville and Corpus Christi, Texas, are weaning a good many devotees away from cotton.

The excessive rains seem to have ceased, and merchants in the South are feeling much better than they did a month ago. We hope and believe that all these beautiful prospects will result in a very satisfactory fall business. In the meantime St. Louis generally is going steadily on her way of prosperity and progress.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—Anything like a rush in the Hardware business would be very unusual at this season of the year. Careful inquiry among the Hardware stores, both jobbing and retail, develops the fact that they are enjoying a better trade than is customary in June. Most houses are either just completing the inventory or just commencing. So far as we have heard results are satisfactory. Some of the jobbers here were prevented attending the meeting of the Southern Hardware Jobbers' Association on account of having to look after the annual inventory at this particular time.

The prospect for fall business in this section is good. The wheat crop will not be a large one, but other crops are looking well, especially hay, corn and cotton. The organized planters of dark tobacco are very hopeful of securing a good price for their product; this will be of great benefit to a good section of our country.

More buildings and other improvements are under way than we have had at any previous time in the Southern cities. The building inspector reports that twice as many houses were built in Nashville during the past 12 months as ever before in the same time. Everything seems to indicate that we are going to have a fine fall business.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—The business situation in Omaha and surrounding territory remains in practically the same condition as outlined in our former reports, with few changes of any kind, and none of importance to distinguish the present period from prior weeks. A free movement of merchandise still continues, and, although agriculturalists are just now busy in the fields with delayed spring work, still the volume of trade is good, and up to expectations. Owing to continued changes in weather conditions that have disturbed outside operations, everything is several weeks behind the average, but every favorable opportunity is promptly taken advantage of to push forward the necessary work. Frequent rains have moistened the soil until this important feature is declared to be in the best possible condition, and it is estimated that the acreage under cultivation is larger than ever. All kinds of labor is well employed, so that no enforced idleness is observable anywhere. All that is needed now is favorable weather for the growing crops, and with this assured general business for the latter half of the year will undoubtedly prove eminently satisfactory.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—Trade in the Pacific Northwest still holds in good, strong volume, although we are nearing the time that will make a change both in demand and class of goods handled. In some sections the lumber industry shows a slight improvement that, we trust, is but a forerunner of better things and an increased demand for supplies in the Hardware line which have been very slow sale for the past two years.

The weather is and has been all that could be wished for to mature the largest crops in our history. The Lewis and Clark Exposition was favored on opening day by ideal weather for such an event. We have an exposition country, climate and resources that we are proud of and we want Eastern people, while low rates prevail, to investigate these conditions.

Collections are fair for the season, though many claim that they will not be able to remit any considerable amount until after harvest, which will mean carrying until October and November.

NOTES ON PRICES.

Wire Nails.—Demand from mill is such as might be expected at this season, especially in view of the large stocks which have been held by jobbers. The continued drain on these stocks has not yet reduced them to proportions which require large additions. Retail merchants are profiting by concessions in price, which in some cases jobbers are making to move these stocks. The larger mills are maintaining official prices. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers.....$1.80
Carloads to retailers..... 1.85

New York.—A steady demand from city merchants and from those at nearby points continues. The local market remains firm and prices are unchanged, as follows: Single carloads, $1.99; small lots from store, $2.05.

Chicago, by Telegraph.—June, like December, is naturally a slow month in Wire products, because retail merchants restrict their purchases to actual necessities in order to reduce stocks before inventory. June is also a month when jobbers are disposed to force the sale of surplus products in order to reduce their inventory tonnage. The price concessions named by jobbers to-day are therefore seasonable and are expected in the trade. Meanwhile the strong mills hold up their prices, well knowing that a weak attitude will retard rather than stimulate buying. Prices as quoted by the leading producer and by large representative independent mills are unchanged, on the basis of $1.95 in car lots to jobbers, $2 in car lots to retailers, with 5 cents advance for less than car lots from mill.

Pittsburgh.—We note a fair volume of orders for Wire Nails, but demand is not as active as expected it would be at this time. Large stocks of Nails held by jobbers are moving out quite freely, but in some cases as the result of concessions in prices having been made. It is probable a meeting of the Wire Nail interests will be held this month, likely next week. At this meeting present conditions will be fully discussed and action taken on prices and other matters that may be warranted. It is not the season of the year to advance prices on Nails, and for this and other reasons it is hardly likely this will be done. The tone of the market is fairly strong, any cutting being done by small mills and jobbing trade. We

quote Wire Nails at $1.80 in carloads to jobbers and $1.85 to single carload buyers, actual freight from Pittsburgh to destination being added.

Cut Nails.—Demand is moderate and reductions are being made in production by mills in the endeavor to keep near the actual trade requirements. Irregularities in mill prices for carload lots are reported, and concessions of 5 cents per keg are frequently made from official quotations. Quotations are as follows: Carload lots, $1.80; less than carload lots to jobbers, $1.85, and to retailers, $1.95, f.o.b. Pittsburgh. Iron Cut Nails, for delivery at Pittsburgh, Buffalo and all points west of these cities, 10 cents advance per keg on Cut Steel Nails.

New York.—The requirements are in seasonable volume, with unchanged market conditions. New York quotations are as follows: Carloads on dock, $1.94; less than carloads on dock, $1.99; small lots from store, $1.90 to $2.

Chicago, by Telegraph.—The prices quoted to railroads and large merchants range from $1.80 to $1.90, Chicago, on Steel or Scrap Iron Nails, while the smaller interests will be quoted from $1.90 to $2, according to size of prospective order. Store prices range from $2 to $2.05, base.

Pittsburgh.—There is more or less irregularity in prices of Cut Nails and demand is only fair. The Cut Nail mills are trying to restrict output to meet actual business, and with some success. We quote Cut Nails at $1.75, base, in carload lots, f.o.b. maker's mill, but on desirable orders and for large lots this price will be shaded 5 cents a keg by mills not identified with the association. For Iron Cut Nails an advance of from 5 to 10 cents a keg is charged over above price.

Barb Wire.—Distribution by mills and jobbers is in fair volume. The market is unsettled, as some of the smaller mills and jobbers are cutting prices. Quotations are unchanged as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.95	$2.25
Retailers, carload lots	2.00	2.30
Retailers, less than carload lots	2.10	2.40

Chicago, by Telegraph.—The market is disturbed somewhat by concessions made by jobbers in order to reduce stocks, but the mill attitude in general is a firm one We quote the following official prices: Painted Wire, $2.10; Galvanized, $2.40; car lots to retailers, 5 cents higher; less than car lots, Painted Wire, $2.25; Galvanized, $2.55; Staples, Bright, in car lots to jobbers, $2.05; Galvanized, $2.35; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The mills are entering some new orders of fair size and the large stocks held by jobbers are being gradually depleted. Some cutting in prices is being done by the small outside mills, which disturbs the market to some extent. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.95	$2.25
Retailers, carload lots	2.00	2.30
Retailers, less than carload lots	2.10	2.40

Smooth Fence Wire.—For the season demand is of fair volume, and contracts are being made by Fence manufacturers. The lower prices quoted by jobbers and by some of the mills has a tendency to keep the market in a disturbed condition. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.65
Retailers, carloads	1.70

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago, by Telegraph.—Manufacturers of Fencing are showing a good deal of activity in making contracts for their Wire supplies and products, and are looking forward to another excellent season. Field Fencing business during the season just closing has been very large and satisfactory, and the prosperous condition of the agricultural West is being reflected in the purchase of better and better grades of Fencing. Bright Wire for manufacturing purposes is also in good demand, but prices are shaded about $1 a ton by some makers. The following quotations are on the basis of $1.80 for Annealed, car lots to jobbers, and $1.85 in car lots to retailers, with 5 cents advance for less than car lots and 30 cents premium over Annealed for Galvanized.

Pittsburgh.—The season is pretty well advanced and a heavy demand could hardly be expected. The mills are entering orders of fair size, but the volume of business is not as large as anticipated. The small outside mills and some of the jobbers continue to cut prices to some extent, which more or less disturbs the whole market. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.65
Retailers, carloads	1.70

Paris Green.—A limited increase in demand is noticed, but so small as to be hardly worthy of notice. Prices remain unchanged and quotations for 5 tons or over are as follows:

Arsenic, kegs	12 c.
Kegs, 100 to 175 pounds	12½c.
Kits, 14, 28 and 56 pounds	13½c.
Boxes, 2 and 5 pounds	13½c.
Boxes, 1 pound	14 c.
Boxes, ½ pound	15 c.
Boxes, ¼ pound	16 c.

The following extras are charged for smaller quantities:

5000 to 10,000 pounds	1 c.
1000 to 5000 pounds	1 c.
500 to 1000 pounds	1½c.
Less than 500 pounds	2 c.

Rope.—Manufacturers are somewhat encouraged by a perceptive increase in demand this week, but not reaching a desired volume. The market has not yet regained its full strength regarding prices, which show some irregularity. General quotations, on the basis of 7-16-inch diameter and larger, are as follows: Pure Manila, 11½ to 12 cents; Pure Sisal, 10 cents; No. 2 quality Sisal, 8 to 8¼ cents per pound.

Window Glass.—It is understood that many jobbers have advanced prices because stocks, especially in the larger sizes, in the hands of manufacturers are unusually light at the time when the factories are soon to be closed down for the summer months. The Johnston Glass Company, Hartford City, Ind., has withdrawn all quotations, owing to the lightness of available stocks. According to reports about 50 per cent. of the Glass manufacturing capacity of the country is yet in operation, representing a capacity of over 1200 pots. Local jobbers report a continued light demand. New York quotations are 90 and 10 per cent. discount on all sizes, single and double, with the exception of the first two brackets of single strength B, which are 90 and 20 per cent. discount. The exception is made to meet the price of machine made Glass.

Oils.—*Linseed Oil.*—Demand is confined to small lots to cover immediate requirements, resulting in a comparatively light business on a firm market. Quotations are as follows: City Raw, 50 to 51 cents per gallon, according to quantity; State and Western Raw, 48 to 49 cents.

Spirits Turpentine.—Since June 1 the New York price of Turpentine advanced, on the basis of machine made barrels, from 76 to 76½ cents to 81 to 81½ cents per gallon, and then dropped to 63 to 63½ cents per gallon, which is the quotation to-day (Wednesday). The drops in prices have been in sympathy with those in Southern markets, owing to heavy receipts, the stopping of manipulations of the market, the lack of demand and the anticipation of further declines. Demand in this market is of a hand to mouth character. New York quotations, according to quantity, are as follows: Oil barrels, 62½ to 63 cents; machine made barrels, 63 to 63½ cents per gallon.

THE COUNTRY HARDWARE STORE.

New Conditions Must be Met With New Methods.

BY HAMMERNAIL.

AMONG the retail trade much is being said about the competition from concerns in larger cities, from the mail order houses, from department stores, even from manufacturers and jobbers seeking the trade of the consumer. To hear some of this talk one would think that the retail Hardware merchant would surely soon be driven out of business. But in spite of all this pessimistic talk one need only look about him to see the fallacy of such an idea. The great growth of a vast number of retail Hardware dealers during the past ten years plainly proves that these merchants are not only able to meet all competition, but are surely fortifying their business for the future.

Fallacy Proven

A New York State town of some 1500 population not many years ago had but one Hardware store. It was, in every sense of the term, a "country Hardware store." There was room in that village for another Hardware dealer, and finally the opportunity was seen by a progressive Hardwareman in another town, who moved his business, and the "lower Hardware store" was opened. The more progressive methods and fresher stock of the new store took some of the business, and also made this town more of a retail center, bringing in trade from the outlying districts. The veteran owner of the old store died, and the business went into the hands of a younger man. And in six or seven years' time this has become the busy Hardware store, and has been twice enlarged to take care of its increasing business.

A Notable Transition

During this time the village has grown but little, the population or wealth of the farming community in the surrounding country has increased very slowly. But the enlarged business of this merchant has been brought about by taking advantage of natural opportunities. This merchant saw the changes taking place. His eyes were open for new conditions and fields. A water works system was being put in the village, the Hardwareman put in a plumbing department, a small line of up to date goods. The business came slowly, but it came, and it is his now at a good profit. The old Wood Stoves were gradually being superseded by furnaces. The Hardwareman secured the agency of two good furnace concerns, and has secured a number of profitable furnace contracts. Following the establishment of an electric plant in the town the Hardwareman added a small line of Electrical Goods. This has also paid.

Natural Opportunities

The farmer's trade has been as closely looked after. New Farm and Garden Tools, Cream Separators and Butter Makers' Supplies have been advertised and exhibited each year at the county fair, as well as Stoves and Ranges. Within 18 months an electric railway has been constructed through the town, and the Hardwareman has grasped this opportunity of enlarging his trade, has delivered by the trolley Stoves and other goods into smaller places, which before he could not reach, and has done it at a profit.

Advent of the Trolley

The success of the merchant chronicled above is not unusual in the Hardware trade and well illustrates how the changed and changing conditions must be and can be met. Progress and expansion are keynotes of twentieth century business and are just as important to the retailer of Hardware in the small town as to the large jobber in the city. This case also proves that the country Hardware store is filling a place that cannot be occupied by any outside competitor. In and about the town above referred to you hear very little talk about catalogue houses. But little of the trade in any kind of goods carried in that Hardware store goes out of town, and simply because this progressive Hardwareman carries the stock of goods people want and by careful buying sells at prices that frustrate outside competition.

Nothing Gets Away

By careful thought and study, and by bringing and keeping his stock up to date the country Hardware dealer can easily make his the best and most profitable business in town. But that merchant, whether in the country or city, who is endeavoring to carry on business and sell the same goods as he did a dozen years ago will surely find himself left high and dry.

Clothes Pounders must give way to Washing Machines, Well Buckets to Pumps, and the merchants who don't see this will surely complain of hard times. A smaller profit must satisfy, but a larger business can be done. The Hardwareman who doesn't realize these conditions will probably have cause for complaints against the catalogue house.

Nearer to Cash

All business is coming nearer to a cash basis. It is possible for even the country Hardware merchant to carry on his business this way. It will put him in better position to meet outside competition. Closely following this plan will enable him to sell goods on closer margins and will give him more money with which to carry on his business.

So long as people live in houses which have to be furnished and equipped and there are farmers who find a market for their produce there will be a constantly enlarging field for the country Hardware merchant.

ARKANSAS RETAIL HARDWARE DEALERS' ASSOCIATION.

THE handsome souvenir programme gotten up in connection with the annual meeting of the Arkansas Retail Hardware Dealers' Association at Little Rock June 21, 22 and 23, has just been issued and is being distributed to the members of the organization and other Hardware merchants of the State. A very instructive and interesting meeting is looked forward to and a large representation of the membership is expected to be present, including many new members added to the rolls since the last convention. Representatives of manufacturing and jobbing interests will also be in attendance in greater force than ever before. Among other visitors will be M. L. Corey of the National Association, and S. Norvell, chairman of the Wholesale and Retail Joint Committee on Catalogue House Competition, both of whom will make formal addresses. Papers on timely topics will be read by a number of members, and the Question Box already contains a selection of subjects, the general discussion of which, as opportunity offers during the convention, cannot fail to be entertaining and helpful. A railroad rate of one fare and a third has been secured on the certificate plan.

NATIONAL CYCLE TRADE ASSOCIATION.

THE fourth annual meeting of the National Cycle Trade Association will be held in New York City on July 25 and 26, and, availing themselves of this opportunity to entertain the visiting jobbers, the manufacturers of Bicycles and Bicycle Sundries, with offices and stores in New York City, have appointed an Entertainment Committee of eighteen to arrange a suitable programme. W. J. Surre of Corbin Screw Corporation is chairman of this committee, and A. M. Scheffey, secretary. The committee is now working out the main features, which will, we understand, include a visit to the Hippodrome, besides a dinner, on the first day, and a trip to Coney Island the following day. Invitations to attend this meeting will be extended to all jobbers in the United States, whether members of the association or not, and visitors are also to be asked to bring the ladies along with them.

THE GREEN BAY IMPLEMENT COMPANY, Green Bay, Wis., will shortly break ground for the erection of a 50 x 110, three-story with basement, solid brick Hardware store, with buggy repository on second floor and storage for Agricultural Implements, &c., in the basement and on the third flooor. The building will be heated by steam and provided with electric freight elevator and modern shelving and equipment throughout. Plans call for its completion January 1, 1906.

FARWELL, OZMUN, KIRK & CO.'S NEW BUILDING.

OLD settlers in St. Paul, Minn., remember well the large, high hill lying between the foot of Jackson and Bench streets. The latter street running directly to the levee on an easy grade was expected to be one of the important thoroughfares of the city. The extension of business interests did not take the expected channel, but followed the river bank a block away, along Third street. Bench street was changed to Second street, and was neglected until brought again into prominence by the erection on it of the handsome warehouse of Farwell, Ozmun, Kirk & Co. The high hill deceived people as to the extension of property which has been lying idle so long. Forty thousand cubic yards of dirt have been taken out of this landmark, known so well to travelers up and down the Mississippi River.

Work on the foundations of the new building was begun last October and has been proceeding steadily through the mild winter, with an interruption only in the month of February. The walls have been made unusually thick and heavy on account of the necessity of holding up the Government property which lies adjacent to the embankment on the north. For three stories the walls are built of Kettle River sandstone. The remaining six stories are built of vitrified building brick, which will show no discoloration. The ground plan of the building is irregular in shape and covers an acre in area, the total floor area being about 10 acres. The trackage facilities for the building are ample. There are two tracks that run the entire length of the building, both being inside the building. The driveway is also inside the building and allows loading and unloading under cover.

The elevator capacity is large and consists of seven electrical elevators, furnished by Lee & Hoff of St. Paul. They will be of large capacity and high speed for freight elevators. The platforms of five of them will measure 8 by 10 feet. The building will be equipped with pneumatic tubes, with a central station and receiving and dispatching stations on all floors and in all departments.

There will be installed a complete system of office ventilation, the fresh air being drawn down from the roof, passed over heating coils and distributed over the office and a large portion of the fourth floor by a blower of ample capacity. The office, which will occupy one-third of the fourth floor, will cover an area equivalent to three-quarters of the ground space covered by the building now used by the firm. The city sales department will be on the same floor, will open on a 28-foot driveway and will have three large shipping doors for the accommodation of the city trade. The heart of the operating department will also be on the fourth floor. The Sporting Goods, Cutlery, butcher supply and printing departments will be grouped around, affording the best possible arrangement for the rapid handling of the business. The three floors below will be used for heavy material, necessitating the minimum amount of lifting and lowering. The five floors above the office will be used for the storage of miscellaneous Hardware.

The style of interior construction is an interesting one in that part of the country, as comparatively little reinforced concrete work has been done in the Northwest. Beginning with the footings, these are 11½ feet square and are figured to sustain a weight of 6000 pounds per square foot. They are made of concrete, reinforced like a checker board with Kahn patented reinforced concrete bars. These bars, imbedded in concrete, are figured of such size and strength as to take up the tensile stresses arising from the superimposed loads. The columns are built of steel I-beams and channel irons and are very heavy. They are filled and surrounded by the best quality of concrete, and are thus made additionally strong. The beams, girders, floors and stairways are also of reinforced concrete, with the exception that over the concrete floors on five floors maple flooring has been placed. There will be an attractive marble entrance, a vestibule and easy stairway rising one floor to the office. The office is particularly well lighted, with large plate glass windows on three sides.

With regard to fire, there perhaps can be no better risk, for in addition to the concrete construction, which has great fire resisting qualities, the building will be equipped with a complete automatic sprinkler system. The building will cost over half a million dollars when completed, and will be a far more effective landmark than the hill of ground which caught the eye of the old steamboat captain as he turned the lower bend of the river.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS *for catalogues, price-lists, quotations, &c., have been received from the following houses, and are referred to the manufacturers:*

FROM JULIAN HARDWARE & IMPLEMENT COMPANY, Julian, Neb., which has succeeded D. H. Stout at the old stand.

FROM W. H. WISDA, Lexington, Neb., who has bought out the Hardware, Stove, Paint and Sporting Goods business of B. F. Harrington.

FROM HENNEPIN HARDWARE COMPANY, 702 Hennepin avenue, Minneapolis, Minn., which has recently opened up in business.

FROM JOS. M. SOMERVILLE, Los Angeles, Cal., who has succeeded W. H. Norwood in the Hardware, Stove and Paint business.

FROM G. H. GOECKE, Triumph, Minn., who has bought out the Dreblow Hardware, Stove and Paint business at that point.

FROM E. S. SNOW, Lakin, Kan., who has succeeded M. A. Mosher in the Hardware, Stove, Paint and Sporting Goods business.

FROM CHAS. J. LUNDELL, Tuolumne, Cal., who has lately opened up in the Hardware, Stove, Implement, Paint and Sporting Goods business.

FROM G. W. HARTMAN & SONS, Stuart, Iowa, who have bought out the stocks formerly carried by G. W. Gardner and A. W. Hadly.

FROM PITTMAN-COATES HARDWARE COMPANY, Battle Creek, Mich., retail Shelf and Heavy Hardware, Stoves, Paints, Sporting Goods, &c.

FROM STOCKLIN & HERRNSTEIN, Chillicothe, Ohio, who have recently opened up in the Hardware, Paint, Glass and Sporting Goods business. Mr. Stocklin had been associated with the Spetnagel Hardware Company for 15 years.

FROM JOHNS & FOSS-ARMSTRONG COMPANY, Red Wing, Minn., which has succeeded Peter Nelson in the Hardware and Plumbing business established by him 32 years since, Mr. Nelson retiring to take a well deserved respite from its cares. The new firm is increasing the size of the store and will both wholesale and retail.

FROM THE OSBORNE-MARLOW COMPANY, INCORPORATED, P. O. Box, 541, Savannah, Ga., which expects to begin business in Shelf, Builders' and Marine Hardware, Stoves, &c., in that city, about August 1.

THE annual meeting of the New England Iron and Hardware Association will be held at the Newton Club, Newton, Mass., Tuesday, June 20, at 6.30 p.m., at which time reports of officers and chairmen of committees will be read and officers for the ensuing year elected.

TRADE ITEMS.

LOUIS A. TRANBERG, secretary and treasurer of John Chatillon & Sons, 85-93 Cliff street, New York, started from this city June 13 on a vacation to the Pacific Coast, expecting to return the latter part of July. His objective point is Portland, Oregon, where he will visit the Lewis and Clark Exposition, now in progress. This is the first vacation Mr. Tranberg has availed himself of since 1872, when he left Portland, where he was then employed as bookkeeper by the wholesale Hardware house of E. J. Northrup & Co., now Honeyman Hardware Company. After leaving Portland in 1872 Mr. Tranberg made a trip abroad, and then became a bookkeeper in John Chatillon & Sons, where he has since remained, rising to his present important position. Mr. Tranberg anticipates much pleasure in calling on some business friends *en route*, and looks forward with great interest to his Portland visit, where he hopes to locate some of the old landmarks of the early seventies and renew acquaintanceships of that period, greeting some friends who were then young with him.

J. STEVENS ARMS & TOOL COMPANY, Chicopee Falls, Mass., will put on the market in the near future a new Rifle, intended especially for boys' use. The company is looking for a distinctive name for it, and with this in view has inaugurated a name contest, open to every one, for which attractive prizes of Rifles will be awarded. The contest terminates August 15.

THE ASBESTOS KINDLERS, OR STARTING RINGS, made by N. H. Palmer & Co., West Medford, Mass., are made in 16 sizes, suitable for the different makes of Blue Flame Oil Stoves, and, we are advised, are generally furnished with tin on the outside to keep them in shape, but when desired they are furnished with tin on both inside and outside; also with a brass wire cloth covering when so ordered. A price-list, issued recently, gives the numbers corresponding to the different makes of stoves and other useful information.

SUPPLEE HARDWARE COMPANY, Philadelphia, Pa., has issued a circular entitled "Ready Made Lawn Mower Ads.," in which attention is called to a series of a dozen advertisements which have been prepared enforcing upon the consumer the virtues and advantages of the Pennsylvania line of Mowers. The company will be pleased to furnish any or all of the electrotypes of these ads. on application. The electros are of two-column width, and less than 4 inches deep, and seem to be admirably adapted to the purpose for which they are intended.

HENRY DISSTON & SONS, INCORPORATED, Philadelphia, state that some of their competitors are labeling and using the word "Keystone" on Saws other than made by Henry Disston & Sons. As the Keystone brand on any kind of Saws is the exclusive property of Henry Disston & Sons, they hold themselves ready to defend this right in every particular.

THE AMERICAN FORK & HOE COMPANY, Cleveland, Ohio, has purchased the plant of the Twin Rake Mfg. Company, at Ladoga, Ind., and is operating it in manufacturing a general line of Lawn Rakes. The trade will be supplied partly from the works there and partly from the other works of the American Fork & Hoe Company.

THE FEDERAL METALLIC PACKING COMPANY, Boston, Mass., has been incorporated in Massachusetts to take over the business of the Standard Packing Mfg. Company, 404 Atlantic Avenue, Boston, manufacturer of fibered Metallic compound packing. The company has an authorized capital stock of $100,000. The officers are: Treasurer, A. Garceau; clerk and manager, W. L. Maloon; directors, these officers and A. A. Highlands.

THE BUTLER CHUCK COMPANY, Greenfield, Mass., has issued a leaflet devoted to a description of the Graves Loose Pulley Oiler manufactured by the company. This device automatically keeps a loose pulley thoroughly lubricated and is easily attachable to most such pulleys, facts which are brought out in the brief but thorough description of the leaflet.

A. B. CLAPP, Brattleboro, Vt., and B. C. Starr, Springfield, Mass., have associated themselves as the Starr Electric Company and have leased the store at 208 Worthington street, Springfield, where they will carry a complete line of Electrical and Gas Fxtures and will do a general electrical contracting business. Mr. Starr has been connected with the Carter Electric Company, Springfield, much of the time for the past 12 years.

THE daily newspaper reports as to the fire in the plant of the North Wayne Tool Company, Hallowell, Maine, have greatly exaggerated the facts in the case. The company's Scythe factory and grindshop adjoining were burned. The statement of loss as $35,000 was excessive, as it will not amount to half that sum, and is fully covered by insurance. The company has not yet taken any definite action as to rebuilding or relocating.

THE factory and offices of William Vogel & Bros., 37 to 47 South Ninth street, Brooklyn, N. Y., manufacturers of Tinware, &c., were partially destroyed June 10 by a fire which started in a factory on another street. This will stop manufacturing operations for a short time. Arrangements for resuming have been made and will soon be perfected, the firm asking the indulgence of customers until various matters can be adjusted. The loss is fully covered by insurance.

THE AVERY STAMPING COMPANY, Cleveland, Ohio, issued June 1 price-list of its line of Cleveland Pattern Hollow Back Shovels, Spades and Scoops; also patented Plain Back Shovels and Spades and Alaska Steel Snow Shovels, Tropic Furnace Shovels, with low lift, and Klondike Sidewalk Scrapers. The company will be pleased to quote discounts to the trade on application.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, price-lists, &c., one copy for our Catalogue Department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column.

THE STOVER MFG. COMPANY, Freeport, Ill.: Eight-page book devoted to its New Ideal Double Acting Floor Spring Hinge. The circular gives views of the Hinge in place and also of the method of adjusting for different tensions.

THE BRIDGEPORT BRASS COMPANY, Bridgeport, Conn., and 253 Broadway, New York: Easel card giving illustration of the company's rolling mills and factories at Bridgeport.

M. D. JONES & Co., 71 and 73 Portland street, Boston, Mass.: Catalogue, copiously illustrated, devoted to a wide variety of their products. A large line of Reservoir Vases of handsome design is shown, together with Pedestals, Bouquet and Flower Vases, Bronze Tablets, Metal Chairs and Settees, Garden Bordering, Sign Plates, Sign Posts and Signs, Cemetery Crosses and Fonts, Wood Rustic Work, Wreaths and other designs in Metal Flowers, Drinking Fountains, Lawn Sprinklers, &c.

GREENE, TWEED & Co., 17 Murray street, New York, manufacturers of Brass Specialties: New catalogue of 142 pages, each 8 x 11 inches. This line has been constantly added to and an idea of the growth of this department of their business is indicated by the increase from 64 pages in their 1900 catalogue. There are 40 or 50 new articles in this book. The line includes Hinges, Lifts, Hooks, Pulls, Handles, Cleats, Pulleys, Turns, Catches, Bolts, Hasps, Corners, Fasteners, Brackets and kindred articles.

RUSSELL & ERWIN MFG. COMPANY, New Britain, Conn., and 43-47 Chambers street, New York: Two attractive card hangers relating to the Russwin Unit Lock and Russwin Liquid Door Check, each 8 x 10 inches.

TAYLOR BROS., Peekskill, N. Y.: Catalogue price-list No. 4, devoted to Pulleys, Hangers, Shafting, Mule Pulley Stands, Pillow Blocks, Couplings, Collars and Power Transmitting Machinery.

SOUTHERN HARDWARE JOBBERS' ASSOCIATION.
AMERICAN HARDWARE MANUFACTURERS' ASSOCIATION.
IN CONVENTION AT HOT SPRINGS.

THE above associations, which met last week at Hot Springs, Va., are to be congratulated on having very successful conventions and in carrying out with exceptional fidelity the programme arranged for their deliberations. There was a good if not especially large attendance of both jobbers and manufacturers, but the gathering was notable for the importance of the subjects considered and the ability and care given to their discussion. The presence also of men of national reputation, such as William H. Taft, Secretary of War, and Edward W. Carmack, Senator from Tennessee, contributed not a little to the interest and the success of the gathering. The National Hardware Association was represented by its president, Samuel A. Bigelow; William W. Supplee, its first president, and T. James Fernley, its able and efficient secretary. The outside or independent jobbers were represented by W. R. Belknap of Belknap Hardware & Mfg. Company. An excellent spirit pervaded the assembly, and with the thoughtful and ample hospitality shown on either side the week was a very enjoyable one for all in attendance.

The Matter of Freights.

The interest taken in the subject of freights was indicated by the fact that both associations had made arrangements for its discussion, and it was also considered at a joint session of the two organizations. On the part of the manufacturers provision was made for its consideration in connection with the report of their Committee on Freights, under the chairmanship of E. B. Pike, who made most careful and detailed preparations for presentation of the subject in its practical relations, and for this purpose had elicited the views of a great many prominent manufacturers and merchants in various parts of the country. Mr. Pike's absence, on account of illness, was greatly regretted, but his views and the results of his work were laid before the convention by his son, E. Bertram Pike, whose report on the subject is given below.

The open discussion of the subject was at a joint meeting of the two associations, which took place on Wednesday afternoon, when Samuel Spencer, president of the Southern Railway, who was present on invitation of the jobbers, made an important address, going into the matter in some detail in opposition to the proposed Governmental regulation of rates in accordance with the provisions of the Esch-Townsend bill. At the conclusion of this address Secretary Taft, who was also present on invitation, replied, criticising some of the views expressed by Mr. Spencer and making an earnest argument for the bill in question. At the conclusion of Secretary Taft's address Mr. Spencer briefly replied, combating some of the positions of Secretary Taft and fortifying the views he had just expressed by a further reference to the law and the facts in the case. In view of the interest of the subject the report of the Manufacturers' Committee on Freights and the addresses and remarks of Secretary Taft and President Spencer are given in the following pages. The question is certain to be canvassed in all its bearings, and these utterances of gentlemen who are familiar with it and whose words carry special weight will be of much general interest.

Jobbers' Committee on Transportation.

The Jobbers' Association Committee on Transportation reported that requests made of railroads for change of classification on a number of articles had been refused. Other requests, however, had been granted, to the satisfaction of the association, among which were the following: The Classification Committee changed its ruling so that mixed C. L.'s of Children's Vehicles (including Velocipedes and Tricycles), minimum 15,000, would take the C. L. rate. A reduction was secured on Picks, Mattocks and Grub Hoes in C. L. from fourth to sixth class. The committee desired to impress the importance of having all of the members keep in close touch with the attitude of their representatives in Congress on the Interstate Commerce bill, and maintained that it is exceedingly important that a conservative and yet strong Interstate Commerce Committee be in a position to protect citizens against excessive freight charges and other abuses along this line.

Miscellaneous Subjects Discussed by the Jobbers.

In addition to the subjects considered by the Southern Association, reference to which is made elsewhere, a number of minor matters of more or less interest were canvassed. The sessions of the association were indeed characterized by a disposition to take hold practically of a variety of matters in which the Southern trade are interested, and members expressed themselves as finding

the meetings exceptionally profitable. Among the many questions thus more or less fully touched upon the following may be mentioned:

THE COST OF SELLING GOODS.—There was some suggestive discussion on the subject of what constitutes the cost of selling goods, especially staples, and also in regard to the remuneration of salesmen in view of the amount of their sales and the profit realized by the merchants. The point was made that certain staple goods might advantageously be handled on a small margin, provided the money thus invested could be turned over frequently. The point was also made that lines yielding a good margin of profit should receive due attention.

LOOSE LEAF CATALOGUES.—The convenience and other advantages of loose leaf catalogues were referred to and the opinion expressed that they have come to stay. The suggestion was made that manufacturers might advantageously adopt a uniform size page, about the size of that, for example, used in the Belknap Hardware & Mfg. Company's catalogue, as by so doing they could with a minimum of expense to themselves and a maximum of convenience to the jobbers provide illustrations and descriptive matter relating to their goods.

MUTUAL FIRE INSURANCE.—An able and interesting address was made by C. H. Miller, president of the National Retail Hardware Dealers' Fire Insurance Company, in which the desirability of mutual insurance among the larger Hardware merchants was referred to. The matter was favorably commented on by the jobbers, who are intending to give it further consideration.

DISTRIBUTION OF GOODS THROUGH JOBBERS.—Reference was made by a prominent member of the Southern Association to the apparent increase in the number of manu-

facturers who, in the endeavor to widen their sphere of action, are establishing their own houses or agencies in important business centers, thus enabling them to go directly to the consuming trade and to the jobbers' customers, feeling that they are within their province as jobbers or distributers. This subject was referred to as calling for consideration from members of the association, and the position was taken that if the manufacturer thus ignores the legitimate channel of distribution through the jobber to the retailer and the consumer the jobbers should hesitate about distributing the products of such manufacturer, even though he be not a disturbing factor in their immediate locality. In this connection it was pointed out that when unoccupied territory has thus been taken possession of and the manufacturer becomes well established as his own distributer it will be more difficult to correct the disturbance than if action were taken in time. The spirit of this suggestion was that if the manufacturers ignore the jobbers they could hardly expect the active support of the jobbing trade.

Growth of the Southern Association.

Since the last convention the following houses have been elected to membership in the association:

Coleman-Wagner Hardware Company, Charleston, S. C.
Scott Hardware Company, Paducah, Ky.

F. B. DUNLOP.

Merritt Hardware Company, Macon, Ga.
Bluefield Hardware Company, Bluefield, W. Va.
Blakeney-Brooks Hardware Company, Paris, Texas.
Monroe Hardware Company, Monroe, La.
Crane-Hinman Hardware Company, Yazoo City, Miss.
Meyer-Neville Hardware Company, Meridian, Texas.
E. L. Wilson Hardware Company, Beaumont, Texas.
Virginia-Tennessee Hardware Company, Bristol, Tenn.

A large number of applications for membership are also in hand awaiting action.

Special Committees.

The following special committees were appointed by President Crumley:

POULTRY NETTING: F. B. Dunlop, S. C. Dinkins, Bruce Keener.
FIRE INSURANCE: J. D. Moore, Geo. E. King, Ben J. Schuster.
NOMINATIONS: J. D. Moore, W. W. Webber, O. B. Barker, Bruce Keener, H. R. Miller.
CAST PLOWS: John Donnan, C. H. Ireland, O. B. Barker, S. C. Dinkins.
AUDITING: J. C. Sproull, S. B. Hubbard, Jr.
STEEL SHAPES: J. Van Dokkum, John Donnan, C. H. Ireland.
WIRE ROPE: J. D. Moore.
STEEL GOODS: George E. King.
CATALOGUE HOUSE: R. M. Dudley.
PRESS: O. B. Barker.

After his election as president F. B. Dunlop appointed the following permanent Committee on Finance: J. D. Moore, C. H. Ireland, Bruce Keener.

Presentation to President Crumley.

At the close of Mr. Norvell's address at the joint session of the two associations, Thursday afternoon, C. W. Asbury, vice-president of the American Hardware Manufacturers' Association, took the floor. He referred to the fact that this was the fifteenth annual convention of the Southern Hardware Jobbers' Association; in other words, its crystal anniversary. He referred happily to Mr. Crumley's identification with the association from the first, and his usefulness in furthering the plans of the organization and leading it to its present

J. C. BIRGE.

position of honor and usefulness. He then, in behalf of ex-Governor Goodell, who had been called away from the meeting, presented a souvenir, composed of steel and cut glass, which he asked Mr. Crumley to accept as a token of regard in which he is held. After suitable acknowledgment from Mr. Crumley, Irby Bennett, chairman of the Reception Committee, presented him the gavel then in use by the association, with the understanding that his committee would furnish his successor with another. These presentations, coupled as they were with expressions of honor and affection, were evi-

C. B. CARTER.

dently highly appreciated by Mr. Crumley, who responded becomingly.

The Pleasure of the Visitors.

Both of the Reception committees, that of the Jobbers' under the chairmanship of Irby Bennett and that of the Manufacturers' under the chairmanship of Henry B. Lupton, made admirable arrangements for the pleasure of the guests and the success of the conventions, and were constant in their attention to those in attendance. Their part in the banquet was performed with distinction,

Mr. Lupton filling the position of toastmaster with exceptional ability, dignity and grace.

The presence of many ladies at the conventions contributed much to the brilliance of the gathering and the pleasure of the delegates. The enjoyment of the ladies, too, was carefully looked after by the Entertainment and

F. D. MITCHELL.

Reception committees, and what with music, social functions, riding, driving and the manifold attractiveness of the place, the week was evidently a pleasant one for them.

There were pleasing courtesies between the ladies of the two associations. An elegant afternoon tea tendered by Mrs. J. C. Birge and other ladies representing the Manufacturers' Association to the ladies of the Jobbers' Association was served on the lawn, and afforded an opportunity for social meeting. The ladies representing the Southern Association manifested a similar spirit of courtesy and entertained the ladies of the Manufacturers' in a most enjoyable drive.

Again at Hot Springs.

President Crumley appointed Geo. E. King, F. B. Dunlop and C. H. Ireland as a committee to confer with the American Manufacturers' Association in regard to

S. NORVELL.

place of next year's meetings. As a result of their deliberations Hot Springs, Va., was again chosen. This decision was very satisfactory to the delegates and all in attendance, in view of the natural attractions of the locality, the exceptional facilities and comfort of the Homestead and the unqualified success of the 1905 gathering. The general sentiment appeared to be in favor of meeting the first week in June.

Election of Officers.

The Southern Association elected the following officers for the ensuing year:

PRESIDENT, F. B. Dunlop, Ft. Smith, Ark.
FIRST VICE-PRESIDENT, J. S. Warren, Memphis, Tenn.
SECOND VICE-PRESIDENT, Frank S. Gray, Jacksonville, Fla.
EXECUTIVE COMMITTEE: O. B. Barker, Lynchburg, Va.; C. H. Ireland, Greensboro, N. C.; Bruce Keener, Knoxville, Tenn.; W. W. Webber, Ft. Smith, Ark.

Restricted Prices.

A strong sentiment apparently pervaded the meetings of the Southern jobbers in favor of manufacturers extending the system of restricted prices with a view to not only permitting but it might almost be said constraining the jobbers to market goods at a profit. An interesting address on this subject will be found in the following pages. In order, however, to secure the co-operation of the manufacturers the subject was brought to their attention by W. W. Webber at a joint meeting of the two associations on Thursday afternoon. Mr. Webber's clear cut and interesting presentation of the subject is as follows:

I have been delegated by my brother jobbers to present to you our views of the restricted price plan on a few of the prominent articles now sold by us at little or

O. B. BARKER.

no margin, and to ask the co-operation of those of you who produce these items.

I take it that it is your desire to do whatever may be in your power, reasonably, to promote the interests of your customers, provided your own do not suffer, and we hasten to assure you that we would not ask any sacrifice on your part of one cent of your money or one hour of your time.

An unfortunate condition prevails among the jobbers concerning margins on certain lines that go far toward making up the bulk of our business, and we are here to-day in the peculiar and anomalous attitude of asking to be saved from ourselves. It is indeed singular that a gathering of men who pride themselves on their ability to do things should appeal to you to aid them in doing something that tends to help them, or probably it might sound better were I to say we are asking you to restrain us from damaging ourselves; but, however that may be, it is a fact that we need discipline, and 'tis a wise man who knows his own ills, and I might say his foibles and weaknesses. We come to you confessing our impotency, our thorough and well demonstrated inability to stem the tide of low prices that seems to have set in. The question has been thoroughly canvassed by our members; the trade papers have enlarged on it from time to time, until it seems there is nothing new under the sun concerning restricted prices.

All of you are advised that we want you, where it is at all feasible, to arrange your methods of handling your product to the end that the jobber will be compelled to make a reasonable margin when he makes a sale. There will be no injustice done to any of us, but rather it will

be a favor which will earn our everlasting gratitude.

You are advised, I take it, that there are now quite a number of items in our line handled under the restricted price plan, and so far as I know to the satisfaction of all concerned. I presume this matter will be handled by a committee who will take up the question wherever their wisdom indicates success awaits them, and to those of you here who are likely to be approached

R. M. DUDLEY.

along that line I want to ask your courteous consideration of the question. We are intensely in earnest. We believe the plan is feasible, sensible and safe, and will be pleased to see all of you fall in line. Your own good sense and unerring judgment will direct you just how it is best to reach the evil, just what is best to remove the cancer that is eating at our vitals and menacing our business by annihilating our margins.

Those of us who have no desire to make money should be compelled to cease our bushwhacking tactics to the end that those who do want to succeed may do so with some degree of comfort and pleasure and to an extent commensurate with the energy and annoyance required. Some of us have no more conception of commercial ethics or of the correct principles of money making than has a hog of a holiday or a Senegambian of "Paradise Lost," and these are the fellows for you to handle. You will not be able to do so by any milk and water policy, but must make up your minds that nothing short of a "Lignum Vitæ" club loaded to scatter will suffice in some cases.

"Whatever is worth doing at all is worth doing well" was spoken or written doubtless before any of us now here had made our advent into life or *début* into business, but age does not detract from a common sense expression like that. Hence, I use it to signify that if any of you conclude to embark on the restricted system you must give all concerned to understand that there are to be no subterfuges, that you intend to be alert and firm in policing your plan, and that we all look alike to you; that you will not play any favorites, nor condone offenses, but that he who strays from the straight and narrow path in this particular will wander into the bogs and briar patches of your displeasure to the tune of the exact amount of rebate due him plus a good stiff fine. The fine might consist of a stated amount of "Uncle Sam's Illuminated Anguish Plaster," or, better still, drop the offender from your list.

Hardware's Special Train.

The special train arranged by A. Eugene Bolles, manager of *Hardware*, left New York on Monday at 4.45 p.m., stopping at Philadelphia, Wilmington, Baltimore and Washington, at which points additional passengers boarded the train. At Wilmington, Del., the special cars containing the Reading Hardware Company delegation and the Philharmonic Band, were attached to the train. The train arrived at Hot Springs at 9.30 Tuesday morning. Returning the train left Hot Springs at 2 p.m., Friday. The party, consisting of both ladies and gentlemen, thus accommodated were very well cared for and thoroughly enjoyed the going and coming.

The Tin Lid.

When President Roosevelt left Washington a few weeks since to spend a month in the Southwest shooting game, he left Secretary of War, Wm. H. Taft, in charge of the Government at Washington. The various newspaper correspondents at Washington, in referring to this change, facetiously referred to the Secretary as "holding down the lid." George H. Harper, representing the Baltimore branch of the National Enameling & Stamping Company, conceived the idea of presenting the Secretary of War at the convention with a tin lid, duly inscribed. The presentation was made by H. B. Lupton of Pittsburgh, Secretary Taft responding in one of those humorous speeches which have made him so popular. The entire affair was apparently much enjoyed by the Secretary and those present.

Harry Wise's Address.

Harry Wise of *The Tradesman* delivered an interesting and instructive address on the "Advantages and Opportunities Afforded by the South for Manufacturing." To show the relative importance of that section, totals in nine and ten figures were quoted from the census of 1900, the latest available, relating to coal, iron and lumber products, there being an invested capital devoted to manufactures totaling $953,857,192, turning out productions valued at $1,184,398,684, representing increases of nearly 100 per cent. in the decade 1890 to 1900. The address dealt with the distribution of finished products, labor conditions, climate, imports and exports, railroad facilities, Southern products, cost of fuel, available raw material, school facilities, tax rates and exemptions, &c.

Resolutions.

The Committee on Resolutions of the Southern Hardware Jobbers' Association reported the following resolutions, which were adopted:

Resolved, That the sincere thanks of this association are hereby tendered to the president, W. M. Crumley, and the officers associated with him for their faithful services rendered in the interest and welfare of our organization during the past year;

Resolved, That a hearty vote of thanks be extended to the manufacturers and their representatives through the Reception Committee, of which Irby Bennett is chairman, for the delightful entertainments which have been so generously tendered the members of our association during their visit to Hot Springs;

Resolved, That the members of our association extend their most cordial appreciation of the honor and pleasure of having the Hon. Secretary of War, William H. Taft, and Hon. Edward A. Carmack, United States Senator from Tennessee, with us at

W. P. BOGARDUS.

our convention, and hereby express our thanks for their participation in the banquet and other features, and, further, that we shall feel it a great favor if we may be permitted to welcome them again to some future convention;

Resolved, That we feel our indebtedness to Samuel Spencer, president of the Southern Railway; to Samuel A. Bigelow, president, and T. James Fernley, secretary-treasurer, of the National Hardware Association; to W. P. Bogardus, president, and M. L. Corey, secretary, of the National Retail Hardware Association; William W. Supplee, William R. Belknap, S. Norvell and other visiting jobbers, who have favored us with their presence and suggestions, and we hereby tender our thanks for the same;

Resolved, That a hearty vote of thanks be extended to the

Homestead Hotel, through their gentlemanly hosts, Fred. Sterry and O. J. McLaughlin, who in their efforts to please have left nothing undone that in any way might conduce to the convenience and pleasure of those in attendance upon the convention; also that the same appreciation be expressed to the Alphin Hotel, which has also extended every courtesy and comfort to their guests;

Resolved, That the cordial thanks of this association be tendered to our worthy sergeant-at-arms, Henry H. Beers, who has so faithfully and effectively performed the duties of his office. While of but small stature he wields a powerful but pleasing influence—may his shadow never grow less;

HENRY B. LUPTON.

Resolved, That we tender to the ladies in attendance a special vote of thanks; they are the sweet and inspiring spirit to whose influence we are pleased to succumb after business and business affairs are disposed of for the day, and without them our meeting, in a large degree, would be a failure;

Resolved, That we express our sincere thanks to Rev. Dr. J. G. Scott and J. F. McAllister, both of Hot Springs, who so kindly and eloquently officiated at our meeting and who have been our guests during the convention;

Resolved, That we express our deep appreciation to John Harbster and to the Reading Hardware Company and to their representatives, especially to the band and other talent who so delightfully entertained us during the convention, for the pleasure afforded the association and their guests by the elaborate entertainment features which were so kindly and generously supplied;

W. W. WEBBER.

Resolved, That we most thoroughly enjoy the very close intercourse and co-operation between the Southern Hardware Jobbers' Association and the American Hardware Manufacturers' Association. We have observed this growing friendship and intimacy with very great pleasure and bespeak the further development of this most favorable tendency toward a closer and more harmonious relationship between these two classes of the trade. When it is recognized that our interests are mutual it will be seen how necessary it is for the jobber and manufacturer to cultivate to the greatest possible extent the benefits which may be derived from this cordial relationship;

Resolved, That we express our thanks to the trade papers who are represented at this convention. Recognizing their prominence and importance to the trade of which we are a part, we invite their presence at all our conventions and solicit their suggestions and advice on all matters of mutual interest.

Souvenirs.

Many souvenirs were distributed at Hot Springs, among which were the following:

HENRY DISSTON & SONS, Incorporated, Philadelphia: Oxidized silver Fob Chain, consisting of four keystones joined, making a very attractive as well as useful ornament.

HOWE SCALE COMPANY, New York: Spanish bills of various denominations.

SIMONDS MFG. COMPANY, Fitchburg, Mass.: Automatic Pencil Holder, with German Silver Chain.

AMERICAN AXE & TOOL COMPANY, Incorporated, Glassport, Pa.: Axe Blade, etched and decorated in red and gold.

NATIONAL ENAMELING & STAMPING COMPANY, Baltimore, Md.: Miniature Wash Basin of Royal granite steel ware.

YALE & TOWNE MFG. COMPANY, New York: Paper Weight trimmed in brass, bronze and bower barff.

AMERICAN SHEET & TIN PLATE COMPANY, Pittsburgh, Pa.: Nickel plated Pedometer.

E. C. ATKINS & CO., Indianapolis, Ind.: Gun metal Watch with oxidized silver Fob.

PETERS CARTRIDGE COMPANY, Cincinnati, Ohio: Match Holder made of three cartridges and a shell.

READING HARDWARE COMPANY: Inkstand, Blotter and Paper Knife, also Ash Tray and ornament in shape of owl, with appropriate cards accompanying each.

AMERICAN CAN COMPANY, New York: Miniature Paint Can containing set of dice.

HOPKINS & ALLEN ARMS COMPANY, Norwich, Conn.: Art plaque showing a country lad carrying Shotgun, brought out in relief.

AMERICAN FORK & HOE COMPANY, Cleveland, Ohio: Artistic calendar.

WM. POWELL COMPANY,, Cincinnati, Ohio: Watch Charm in the form of the company's trademark.

J. D. WARREN MFG. COMPANY, Chicago, Ill.: Flemish oak Desk Cabinet containing two cut glass inkwells, sponge and eight compartments for Penholders, Pencils, Elastic Bands, Wire Clasps, Pins, Pens, Erasers, Stamps, &c., a sliding glass cover protecting the contents from dust.

FAYETTE R. PLUMB, Incorporated, Frankford, Philadelphia, Pa.: Miniature Machinists' Hammer, neatly boxed.

WINCHESTER REPEATING ARMS COMPANY, New Haven, Conn.: Silk Fob with medallion with miniature *fac-similes* of Paper Shells.

INTERNATIONAL CUTLERY COMPANY, Fremont, Ohio: Pocket Scissors.

MERIDEN CUTLERY COMPANY, Meriden, Conn.: Ornamental Paper Weight in the form of a silver plated Anvil.

ONEIDA COMMUNITY, Oneida, N. Y.: Silver plated Bon-bon Spoons.

RUSSELL & ERWIN MFG. COMPANY, New York: Artistic Pocket Screw Driver, boxed.

NORTH BROS. MFG. COMPANY, Philadelphia: Pocket Screw Driver.

G. & H. BARNETT COMPANY, Philadelphia: Manicure File in leather case.

NICHOLSON FILE COMPANY, Providence, R. I.: Manicure File in steel case.

DANA MFG. COMPANY, Cincinnati, Ohio: Pocket Memorandum Book.

SAVAGE ARMS COMPANY, Utica, N. Y.: Ornamental Baggage Check and Name Plate.

SOUTHERN EXECUTIVE COMMITTEE'S REPORT.

O. B. Barker, chairman, presented the report of the Executive Committee, which is substantially as follows:

The report first referred to the responsibility felt by the committee in making the report. Possibly some of the old members who had not taken a deep interest in the association's affairs may have felt that many needed reforms had not been accomplished. The explanation was that conditions and circumstances were not always favorable for securing proper and needed legislation. Certain sections of territory may be suffering from conditions imposed by the manufacturers, while another section is greatly benefited by the same arrangement. For the association to demand of the manufacturers that a plan be changed would bring about a disagreement within the ranks of the association. The proper method to adjust such troubles would be for the jobbers who are interested or inconvenienced to bring their troubles to the manufacturers' attention, and if there were justice in their claims the manufacturers would open up negotiations with the association. Again, the association may be working on needed reforms which require perhaps years to bring about the desired relief.

Only one meeting was held during the year, and that

at Knoxville, Tenn. At that meeting considerable correspondence was taken up and considered relating to complaints against manufacturers, demoralization in prices on various lines brought about by jobbing competition, lack of uniformity in terms of sale from jobber to retailer and other similar troubles, and provision was made to have the same discussed at this convention in the hope that some satisfactory solution of the difficulties could be reached.

The report said that one of the most important subjects for consideration at the convention was a satisfactory arrangement between the manufacturer and the jobber for the enforced maintenance of stipulated prices upon a profitable basis. That in the judgment of the committee the jobbing interests had in a measure reached a crisis—in other words, restricted prices, if satisfactorily adopted and enforced, meant further development, increased usefulness and profitable returns for the Hardware jobbing business. But if no favorable action or uniform arrangement was consummated for the control of prices upon staple and kindred lines, which have been brought down to a plane of unprofitable handling, then there was no hope for the advancement of the jobbers' interests, but rather certain indications of a steady depreciation in the importance and volume of the jobber as one of the principal channels of distribution. The association must decide upon a plan which has the sanction of the majority of the members and of jobbers from other sections if it hoped to have the manufacturers favorably treat with the association on the subject. The committee referred to the efforts made to control prices on several leading lines.

The committee expressed the opinion that if the association was to accomplish the greatest good the members must become specialists. Proper returns from association work could not be secured by confining its work to generalities. Special committees of two or three members should be appointed to handle certain lines. These committees should be expected to confer with each other and with the manufacturers when found desirable.

The report said that the catalogue house question had been given careful attention by the committee. On the question of terms the committee recommended that this question be taken up and carefully considered by the association. Some method should be devised to awaken the interest of the members in this question.

Certain changes were suggested in the constitution and by-laws looking to an increased revenue from the membership to provide the association with funds to carry on the work proposed for the coming year. In conclusion the committee recommended the following resolutions:

Resolved, That while we appreciate the great kindness that the manufacturers and their representatives have shown us in entertaining us so elegantly in the past, yet we feel some embarrassment in accepting so much from them; therefore, be it

Resolved, That the members of our association who participate in the entertainment features bear their proportion of the expenses of all future entertainments at our annual convention.

The report of the Executive Committee was taken up for consideration in detail. After some discussion the recommendations contained therein were adopted as a whole. As to membership in the association it was also decided that any firm or corporation whose business is the selling of Hardware at wholesale, exclusive of machinery, implements and mill supplies, and whose sales to merchants are not less than 75 per cent. of their gross sales and who have not less than three regular salesmen on the road, and whose capital is not less than $50,000, upon application to the secretary in writing and a four-fifths vote of the Executive Committee may become a member of this association upon subscribing to the constitution and by-laws and payment of $25 membership fee in advance, and agreeing to pay annual dues of $50 within 30 days after each annual meeting.

The association also recorded its unqualified disapproval of any manufacturer marketing any part of his product through any other channel than the legitimate Hardware jobber, and when this policy is disregarded by any manufacturer the offending party shall be reported to the secretary, who shall take the matter up through personal correspondence and endeavor to get the manufacturer to discontinue this practice; and the association further most earnestly protested against manufacturers selling the small dealers at all, as by doing so the small dealers frequently purchase more goods than they can legitimately handle and therefore dispose of the surplus at cost, to the damage of the jobbers for hundreds of miles around.

SPECIAL BRANDS.

One of the most important and interesting subjects considered by the two conventions was that of special brands. It was brought up by the manufacturers, as announced in our last issue, through a special report of a committee of 19 who had given very careful consideration to the whole subject. This report, representing the unanimous sense of the committee, was adopted without a dissenting voice by the manufacturers at their meeting on Wednesday, 7th inst., and was duly communicated to the jobbers that they might give it such attention as in their judgment it deserved. The result was the adoption of a report in which the views of the jobbers on the subject were distinctly and forcibly stated and the communication of this report to the Manufacturers' Association. The matter was also touched upon in a joint meeting of the two associations by S. Norvell, who combated the position taken by the manufacturers and maintained, with ability and force, the position of the jobbers in regard to the practice in question. Mr. Norvell's interesting address will be found on another page.

The reply of the Southern Association was in the form of comments upon the successive paragraphs of the report adopted by the manufacturers, and in order to present clearly the positions of the two associations we print below the two reports in parallel columns:

Report of the Manufacturers' Association:	*Reply of the Southern Association:*
Your special committee of 19 members to whom was referred the matter of jobbers' special brands, having unanimously adopted the following report, respectfully submit the same with the recommendation that it be adopted by the association:	Your committee, to whom was referred the report of the Special Committee of the American Hardware Manufacturers' Association, concerning the use of special or private brands by jobbers beg leave to submit the following report:
1. Investigation leads to the conclusion that at the present time manufacturers of Hardware confine their business largely to jobbers. Many manufacturers in other lines of trade sell their products extensively to retailers and consumers.	Paragraphs 1 and 2 of the American Hardware Manufacturers' Association Committee's report are very gratifying to us, because they indicate the tendency of manufacturers to distribute their wares through the jobber—"a consummation devoutly to be wished."
2. As an association we have favored the policy of distributing goods chiefly through the jobbers as being the most favorable method for the trade at large, provided the reputation of the manufacturers and the preferences of the consumers are fairly considered.	
3. In the last few years, however, there has been a growing practice on the part of many jobbers whereby they stipulate that the manufacturer's name shall not appear on manufactured articles which they purchase, but in lieu thereof that the jobber's name, with some special name, brand or device, shall be placed upon the goods. It is further required by these jobbers that the name distinguishing such brand, as well as the brand itself, shall be used only upon the goods of the jobber first adopting such name.	We plead guilty to the indictment contained in paragraph 3 of said report, and desire to enter a confession in avoidance—confess that we have objected to using factory brands and avoid any criticism therefor, because some manufacturers allowed their factory brands to be handled and exploited at a margin not above the cost of doing business, hence we were compelled to seek shelter under brands of our own, which action we have found meets the indorsement of many of our customers.
4. The practice of using jobbers' special brands results in an increased cost to the manufacturer, for which some one must be the loser.	We concede the force of paragraph 4, but suggest that whatever may be the increased cost may be added to the price the jobber pays.
5. There are many jobbers who, as the result of slight concessions in prices given by a competing manufacturer and with no reasonable assurance of a maintenance of quality or of improvement therein, have their goods of a given kind made by various manufacturers, so that the goods bearing such jobber's brand of necessity cannot be expected to be uniform in quality.	For the sake of argument we will concede that the charge in paragraph 5 may perhaps be true, and, if so, do we not run the same risk when we change from the brand of one factory to that of another?

6. The obvious tendency of this practice, and especially if it be adopted as the result of competition in prices, is deterioration in quality.

If, as charged in paragraph 6, that competition in prices is the forerunner, or John the Baptist of deterioration in quality, may not the deterioration come under factory brands, because we claim that we are just as jealous of our reputation as any manufacturer can be of his—that we will not consent to a lowering of grade, and that if it is done the manufacturer is at fault in not giving us the grade contracted for.

7. Manufacturers are generally willing to stand behind the jobber or any other purchaser on the quality of their goods bearing the manufacturers' own established brands. Jobbers guarantee against defects some articles which bear their private brands, yet it must be apparent that the inferior quality of a Knife, Saw, Carpenter's Tool or other article of Hardware does not necessarily imply such a defect as would be covered by an ordinary guarantee, for the reason that an article may be of inferior quality and yet not be defective.

Paragraph 7 can be held to apply to both factory and private brands, in that either or both may be of inferior quality and not be defective.

8. The best articles should not only be free from defects, but should be made of the best quality of materials and workmanship, and worthy not only of the recommendation of the merchant, but also worthy of the name and indorsement of the manufacturer.

9. We believe that knowledge as to who really produces any article may be of value not only to the person who will use such article, but also to the retailer who sells it.

We desire to controvert the declaration in paragraph 9 and insist that the knowledge of who produces a certain article can in no wise concern a person who will use it, because in any case the retailer looks to his jobber to correct any evils, and the consuming customer looks to his retailer, hence it is not necessary to hand out a pedigree with every article sold.

10. If an article bearing a manufacturer's brand has proven to be of excellent quality and in all respects very satisfactory, and the buyer desires to secure another of exactly the same character, he may do so from the merchant who furnished the original, or possibly through another merchant, and in either case with the assurance that it is of like quality and pattern as the original. If an article under a jobber's brand has proven unsatisfactory, a retailer has no assurance of obtaining an article of better quality under another jobber's private brand, for the reason that both may have been made by the same manufacturer and of like quality, and this for the reason that manufacturers who make special brands are compelled to put out the same grade of article to many jobbers under their many private brands.

The reasoning in paragraph 10 contemplates that a user will never be disappointed in anything except those under a private brand, and further that the guaranty of a jobber is nil.

11. A jobber may without serious loss discontinue the use of any of his many brands on any given line of goods in case the reputation of such brand becomes impaired, but "a manufacturer who has built a reputation on his goods knows its value as well as its cost and will maintain it."

In answer to paragraph 11 we will say that the reputation of private brands will not become impaired if manufacturers are as careful in their manufacture as they are in their own, and we trust they will at least claim to do honest work.

12. The younger and smaller factories under the system of jobbers' special brands can have no hope of establishing for themselves a reputation, as was done in former years by some manufacturers whose goods have become favorably known as the result of honest work and good material. There is, therefore, under the present system of using special brands but little stimulus which would lead manufacturers to make goods of the best possible quality, such as are desired by intelligent consumers.

The above answers paragraph 12.

13. We are compelled to report, as the result of a full exchange of experience with representatives of the various branches of manufacturers composing this association, that in our judgment the practice now pursued by many jobbers by which their goods are made under private brands (and, in fact, the present methods of marketing these brands which is pursued by many jobbers) is not for the best interests either of the manufacturer, the merchant or the consumer, as nearly all jobbers admit that their chief reason for requesting special brands is because they can make a greater profit thereon, freeing themselves from competition, often buying a second quality and selling it under a private brand as first quality. On the other hand, a manufacturer with an established reputation will not allow his name to appear on anything except his best qualities of goods, using brands without the factory name for lower grades.

Paragraph 13 is drastic and far-reaching in its effects, and should have been well considered before it found its way into print, because it sets forth charges against the jobbers that are hurtful, places the jobbers in the attitude of a confidence man, and publishes to the world that he is a pastmaster in double dealing. We desire to enter a plea of not guilty and submit our cause to the retailers of this country for answer.

14. A few months ago a number of Hardware manufacturers were selling their own established factory brands of various grades and in considerable quantities through the so-called catalogue houses, the goods going from these houses direct to the consumers. As the business of these houses seemed to be reaching immense proportions, a committee of Hardware merchants requested various manufacturers to discontinue the practice of furnishing these houses with their wares.

Paragraph 14 is mainly historical and needs no answer.

15. Some of our members, however, claim that the refusal of the manufacturers to sell these catalogue houses will deprive many consumers of the only means of obtaining goods bearing the manufacturers' brands, unless the manufacturers will sell to the consumers direct, which policy the manufacturers as a class are disinclined to adopt. They also claim further that it will deprive the manufacturers of an important avenue of distributing staple brands and in quantities fully equal to that purchased by many large jobbers.

In answer to paragraph 15 we have to say that we do not believe the marketing of the manufacturers' product through the jobber will bring the dire results contemplated, because numbers of us not only carry our special brands, but factory brands as well, the latter frequently in larger quantities than the former.

16. We desire as far as practicable to co-operate with the merchants of the country by distributing our products through "the avenues of trade" which the Merchants' Associations have frequently prescribed as being the ones that they would wish us to follow; but if we abandon all other avenues of trade except the one wherein the jobber becomes practically our sole distributer, and if we permit him to establish and in many cases lower the grades and eliminate our names, we sink the individuality and reputation of hundreds of manufacturers representing long experience, great investments and the highest skill, and we believe such a policy will not best serve the interests either of consumers or of retailers. With this condition it will be impossible long to restrain many manufacturers from selling through such channels as will carry their own best goods to the consumer. A fair consideration of this subject by jobbers and retailers will greatly aid in solving the problem.

We think their view of the conditions cited in paragraph 16 are pessimistic, and that no such calamity awaits them, because in paragraph 18 they concede that "many jobbers do now preferably sell manufacturers' brands," and in the opinion of your committee the danger of private brands affecting the prosperity of the manufacturer will vanish as the mists before the morning sun, when it shall become apparent that a margin can be made on factory brands.

17. We therefore ask the Southern Hardware Jobbers' Association now in session to consider the question, whether or not the sale of standard factory brands in preference to the enormous multiplicity of irregular private brands would not also be to their advantage. We invite this consideration with the assurance that we certainly can and do furnish goods bearing our standard brands fully equal in quality and certainly at as low prices as those at which we will furnish similar goods with special brands.

18. Many jobbers do now preferably sell manufacturers' brands. Some doubtless have adopted the use of private brands in view of the possibility that if an article bear-

ing a manufacturer's brand proves to be highly satisfactory or profitable to the retailers and consumers such persons may seek to deal direct with the producer. The present policy of the manufacturers should certainly remove this fear, if it exists; but we believe that the use of jobbers' private brands is calculated more than anything else to drive the manufacturers to a more direct distribution of their goods.

19. Such merchants as will assist in the mitigation of this evil by handling regular manufacturers' brands will receive our most cordial support and co-operation.

ANNUAL ADDRESS OF W. M. CRUMLEY, PRESIDENT.

Fifteen years ago a few Hardware jobbers met in the city of Knoxville, Tenn., and organized this association. I hardly think that any one of them dreamed how their work would grow. I believe we have the honor of being the first commercial association to form in the United States. It certainly was a wise thing to do, else our example would not have been so extensively followed, for there is hardly a State now in the Union that does not have its Hardware association, and there is no man who could tabulate the benefit and good that has been done the commercial world by their work; and yet our work has just begun, for there were many things which we dared not tackle alone which we fearlessly take hold of now, because we know we will be supported by all these other associations. Though we have separate organizations, when one or other needs help to correct a public evil we stand as one man and with such power that when we put our shoulder to the wheel something has to move.

GREATER SUPPORT; MORE ACCOMPLISHED.

Let us therefore not weary of our work, but let every member give his best thought and effort to our Southern Association that it may continue in the front as an association, for the closer allegiance you give it makes our strength and power the more assured.

IMPORTANT QUESTIONS THAT NEED WATCHING.

I will not weary you with a recital of our year's work, for that report more properly belongs to your secretary, but I will call your attention to a few things which will need your best effort and thought to correct in the year that is ahead of us.

1. The Parcels Post bill will need watching, for the catalogue houses are using every effort to have a law passed that will enable them to reach the consumer through the mails, thereby damaging the retailer, whom you must protect at all hazards, for it is from him you get your business. Therefore I would recommend that you by resolution have a committee appointed from this association to work in conjunction with a committee from the other associations, whose business it will be to keep watch on these people and see that no law is passed that will be detrimental to the retail trade. I would recommend that you continue our committee on catalogue house question, for its work has been well done so far, but it is far from finished.

2. The freight question will require your best efforts. The railroads have become so arbitrary that they are almost unbearable. Even when they acknowledge an injustice they take no steps to correct it. They scarcely deny that they seek and do control our Legislature, and if they are not soon checked they will throttle even the Government itself. The American people are patient, but when once aroused, even these great corporations had better look out. There are many vital matters to be discussed by the association during the session, and let me beg each member to be punctual and prompt in attendance on the meeting, giving us the benefit of your advice and the encouragement of your presence.

IMPORTANCE OF ALLIANCE WITH MANUFACTURERS' ASSOCIATION.

It is with great pleasure that I can report that we have the sincere respect and confidence of the Manufacturers' Association. We must keep this, for without it half of our strength is gone. Your Executive Committee will make recommendations to you in its report which I hope you will consider very carefully, for they come from people who have given their time and best efforts to this work. In this connection, and in closing, I wish to give those gentlemen and your secretary and the whole association earnest thanks for the uniform kindness shown me as your executive officer and to bespeak for my successor your full and earnest allegiance, and to recommend that whatever association you may be members of, your first duty shall be to the Southern Hardware Jobbers' Association. We have many visitors with us. We bid you all welcome and will be glad of your attendance on our sessions.

SECRETARY CARTER'S REPORT.

In submitting a report of the work transacted through the office of your secretary-treasurer during the past year we wish to convey to you as forcibly as possible the importance of the work, both in a general way and specifically. We feel that it is not only desirable but also absolutely necessary that every possible influence for good which the association is capable of exerting shall be fully developed. To accomplish this result it has reached the point where every symptom must be analyzed, and where trouble is found special treatment should be prescribed and the patient placed in proper hands, in order that it may be carefully watched and every unfavorable tendency checked in its incipiency. Favorable conditions must be nurtured and such treatment applied as will develop the same in every possible way. A comparison of the Hardware jobbing business to the human body may possibly illustrate our views in a more concise manner. Just so sure as the human body is the highest form of animal nature, responding quickest to every form of impression which can be described, so is the Hardware jobbing business the highest form of commercial dealings, being recognized as the barometer of trade by all lines. For the human body to have health and happiness and retain the same conditions must be favorable. In other words, the body must be supplied at regular intervals with food and drink, and the same must be nutritious as well as satisfying. A too large proportion of satisfying food but possessing little if any nutriment will soon bring about unfavorable conditions. If a change in diet is made in time no serious trouble will result, but, on the other hand, if no steps are taken to remedy the trouble the body will become unhealthy, and unless medical aid is secured and vigorous treatment prescribed and followed the body will die. Again, if the human body is surrounded by pleasant circumstances and trouble of every form is avoided happiness and contentment will result, but if conditions are unfavorable and troubles develop then the body becomes unhappy, and unless relief is afforded there will be a complete breakdown, insanity and perhaps a trip across the river from which no traveler has returned.

CONCERNING PROFIT MAKING.

We do not think we are making a mistake in stating that the Hardware jobbing business is susceptible to the conditions just enumerated. For the jobber to succeed or even exist the business must be healthy. By health we mean that the goods which are purchased for resale should be profit bearing. In other words, there should not be too large a proportion of staples, which may be termed satisfying lines, which are sold without a profit, and often at an actual loss when considering the cost of doing business. We do not claim that it is possible at all times for some lines of staples to be sold at a profit above the cost of doing business, but we do claim that unless the proportion of these unprofitable goods is much in the minority the business will become unhealthy. An unhealthy person and an unhealthy business cannot hold their own against the troubles that confront them. There is no such thing as holding your own or breaking even. If there is no gain in health or no profit, then there must be deterioration or loss, and

under such conditions it will be impossible to stop the retrograde movement. If the jobber does not possess the nerve to ask a remunerative profit upon the goods he sells, or is unable to secure such results through co-operation with his fellow jobbers or through the manufacturers, then there is little if any hope for a continuance of the business. It is also true that inside and outside complications in a jobber's business, causing worry and vexation, will also prove detrimental to the welfare of the jobber. Experience has shown most conclusively that a divided house will fall sooner or later, and the same is true along other lines. The point we desire to impress upon you is that the Hardware jobbing business is the highest type of commercial traffic and should be trans acted upon the same high plane. This result can only be secured by the jobbers operating their business along profitable and satisfactory lines, and it is to assist in accomplishing this result that we are laboring.

It will not be necessary for us to review in detail the past year's work. Our office has kept you promptly and fully posted as to all matters of importance which have been taken up for consideration.

A larger amount of traveling has been performed by your secretary-treasurer this year than at any time in the past. The attention which has been given to local associations by our organization during the past few years has called for further enlightenment upon the part of the jobbers and the services of your secretary have been requested and utilized to good advantage by the jobbers at various points.

SECRETARY TAFT'S BANQUET ADDRESS.

At the banquet on Tuesday evening, when Secretary of War William H. Taft rose to respond to the toast "Our Country" he was greeted with prolonged applause. He congratulated the guests and the associations on their place of meeting, and the Southern Hardware merchants and iron manufacturers upon their growing prosperity. He said that Birmingham was challenging the supremacy of Pittsburgh, that Atlanta, Galveston, New Orleans, Pensacola and other Southern cities were becoming sharp competitors for the business of the Northern and Eastern cities. The North, however, did not begrudge the prosperity of the South. Referring to the subject assigned to him, he said that it was freedom of individual effort that had made the marvelous prosperity of the United States. The freedom of opportunity enabled men to rise from obscurity to positions of prominence and so become leaders of industry. He said the present was certainly a peculiar time. The great prosperity of the country added to the general confidence, without regard to party, in the President of the United States, Theodore Roosevelt, has created an era of good feeling in politics. Referring to matters in which the people might make progress he expressed the hope that by legislation discrimination in railroad rates, boycotts and other abuses could be remedied.

He said our foreign relations were in a very interesting state; that the Russian-Japanese War had reached a point where all hoped for a return of peace. The attitude of the President of the United States was well known upon that subject. He was anxious, if he could be sure that both parties were willing to accept his good offices, to bring the belligerents to a conference which may lead to conciliation.

The speaker referred to the relations of the United States with China and said we were now engaged in trying to make an arrangement with China which shall not be as unjust to China as the present practice under the Chinese Exclusion act. That China looked toward America as her nearest and best and least land grabbing friend. That in seeking that enormous Oriental trade with the 400,000,000 of China we should be governed by a just and enlightened policy; that in excluding the Chinese we should discriminate between the Chinese laborer and the educated and commercial class of China. That we ought to make our treaty of such a character that it shall not subject Chinese merchants, Chinese students or men of high character, who come to this country to take back to China the best of our ideals, to insult and contumely merely to prevent a few hundred Chinese coolies from getting through the meshes.

Referring to the Philippines, he said the American investor and merchant had not yet been taught to run the risk of putting his money a long way from him. He looked for a change in that respect and then the foreign investments of this country will increase as those of England have done. He said the islands would become a credit to the United States if we would follow the rule which McKinley laid down that we must deal with the Philippines for the benefit of the Philippines. We must let the products of this country into the Philippines free and admit their products free into this country. He said there were many things in our internal affairs that needed remedying. One of the first things in his opinion was a reform in the administration of criminal laws. The reason for lynching could be found in delays in the administration of justice.

Another matter needing reform was the divorce law in the United States. He closed his remarks on the question of reform by referring to the low salaries paid to officials in the United States. He said there were many problems before the people to be solved, but we could rest assured that with a people as courageous, as energetic and as resourceful as ours those obstacles will be overcome and the progress toward the highest ideals will continue.

ADDRESS OF S. NORVELL ON THE CATALOGUE HOUSE QUESTION AND SPECIAL BRANDS.

I will ask your indulgence in listening to the following remarks on the subject of the catalogue house question and of special brands, as I came here without any idea of speaking at length upon this subject. It was my intention to review very briefly the work of the Catalogue House Committee the past year; but just an hour or two before this meeting I was handed a copy of the resolutions adopted by the manufacturers. These resolutions, which will, of course, be published, seem to me to give such wrong impressions that I feel that it is my duty in defense of the entire jobbing Hardware trade of the country to take direct issue with them in some of their conclusions. I have not had time to prepare this address with care, therefore you must remember that these remarks are impromptu and given without notes.

THE CATALOGUE HOUSE QUESTION.

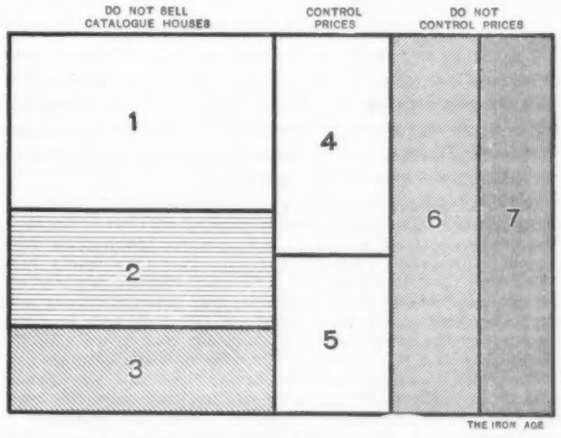
It is just a little over a year since I had the honor of speaking to the Southern Jobbers' Association at Atlanta—May 25. It was predicted at that time by some of my good friends among the manufacturers, who talked to me frankly, that this catalogue house movement would soon play out. I believe at the end of the year I can say that there has never been a question in the Hardware trade of the United States that has been discussed as much, has been written about as much, has had the general attention that has been given to the catalogue house question, and our committee take some credit for this general interest, because we have tried to keep things going.

Now this past year we have been carrying on a campaign of education. I want to say that I have been surprised, after I posted up myself, to find how little the manufacturers and jobbers—intelligent men and men at the top of the trade—knew of this subject—how few jobbers knew of the prices being made by the catalogue house. You would imagine the jobber would know if the manufacturer did not. You would suppose if the manufacturer's goods were in the catalogue house catalogue, with large type, in the top of the page, that he would know it, still in New York City I produced one of those catalogues and showed it to one of the principal manufacturers in this country, and when he saw how his goods were displayed in the catalogue, he simply said: "Mr. Norvell, I did not know it."

THE CATALOGUE HOUSE COMMITTEE HAVE BEEN CRITICISED

for giving this matter so much publicity, saying we help

the catalogue house; but we must remember that this publicity has been in the trade papers, which do not go to consumers. On one side we have been criticised for talking too much on the subject, and on the other side we received letters from the trade papers: "Send us along some matter; we would like to hear from you," and we have tried just as much as posssible to keep out of the trade papers the last year. We have tried to avoid personality and antagonism. We have tried to be persuasive. We have written a great many letters to manufacturers. Every manufacturer has been classified, and this work of art (referring to the diagram given herewith) represents the manufacturers.



Mr. Norvell's Classification of the Positions of Manufacturers on the Catalogue House Question.

Every manufacturer in the United States is in one of these classes. We have gone at this work systematically. We have the documents we have been accumulating in this matter, all carefully filed. Now, in these blocks we have tried as nearly as we could to give an idea of the proportion of manufacturers of the different classes. In other words, this general space, including classes 1, 2 and 3, represents manufacturers who have come out and said they will not sell catalogue houses. You will notice that is the largest of the divisions. We have divided these manufacturers into three classes. Class 1 are those who say they will not sell catalogue houses, and who do not sell them, who have been consistent, not only do not sell them, but try to keep their goods out of their hands. Class 2 are manufacturers who have gone on record to say they will not sell catalogue houses, and do not sell catalogue houses, but if some broker or commission merchant sends them an unusually large order they do not investigate it very closely. They literally live up to what they say, "we will not sell catalogue houses," but they make no effort whatever to follow their goods and see where they go. Class 3 are manufacturers who said they would not sell catalogue houses and about whom other manufacturers have some very pointed remarks to make. We will let that matter rest there.

The division, classes 4 and 5, represents manufacturers who work on the principle that they will sell catalogue houses and control the price. Class 4 represents manufacturers who control the price at such a figure that the retail dealer can compete with the catalogue house and make a living profit. Class 5 are those manufacturers who control the price at a figure that the retailer cannot compete with and stay in business.

Class 6 represents manufacturers who are noncommittal or who have written us beautiful hot air letters. I wish you could read some of the letters we receive; as works of art in letter writing they are dandies—four or five pages and nothing said.

In No. 7 are the manufacturers who come out and state, as one manufacturer did, that the catalogue house is like the telephone or the trolley line and has a right to exist, and the best thing for the jobbers to do is to turn into catalogue houses themselves. In other words, they take the stand flat footed that they propose to sell catalogue houses and do not want any dictation from jobbers. I want to say out of respect for that class of manufacturers that they are men who have their convictions and they are willing to stand up truthfully and defend those convictions. Among these manufacturers who believe in the trolley car and telephone is a class of gentlemen, one of whom—one of the most prominent in the country—came to my office. "Mr. Norvell," said he, "you are all wrong in this proposition. You must reach the consumer at the least possible cost, and anything to prevent reaching the consumer at the lowest cost is against modern progress, is against modern development." "All right," said I; "how about your line of goods? Do you believe in patents" "Oh, yes." "Your machinery is patented?" "Yes." "Your goods are patented?" "Yes." "Well, does not that interfere somewhat with the goods reaching the consumer at the lowest possible price?" "Yes, but you know our machinists must have some reward for their brain power." "Well, you are a good stanch Republican and believe in a high protective tariff?" "Oh, yes; our industry must be protected." "Well, how about reaching the consumer at the lowest possible price?" "Well, now, Norvell, don't talk foolishness." "Besides the patents and the protective tariff you are a member of an association; you get together, half a dozen of you that make this line, and control the thing, don't you—get a price fixed? At the same time you regulate the price at which the jobber sells the goods. If we should cut the price we are liable to be called before you and spanked. We have State laws in Missouri making it a penalty of $5000 fine and five years in the penitentiary for signing your agreement. We make criminals of ourselves! How about you reaching the consumer at the lowest price?" "Norvell," he said, "you are a darned crank."

Now, gentlemen, we do not object to the tariff, we do not object to the patents, we do not object to the associations, we do not object to being controlled, but, as they used to say out in Colorado, where I traveled, "we want to be in with the dealer or we will break up the game."

A LITTLE PROTECTION WANTED.

What we want in this catalogue house question is a little protection, the same kind of protection that the country is giving you. It does seem to me that the manufacturers in this matter—some of them—are very short sighted.

COST OF DOING BUSINESS.

I find when I come in contact with manufacturers—and I talk with a great many of them—there is one thing they all forget about, and that is the cost of doing business. The manufacturer fixes up the catalogue house proposition and takes the jobber's cost and adds 20 per cent. to that, and says: "What is the matter with that to the consumer?" I say: "All right, but it costs the average jobber 15 per cent. to do business, and it costs the average retail dealer 20 per cent. to do business, and you add 15 per cent. and 20 per cent., and it is 35 per cent. before the goods get into the hands of the consumer at 1 cent profit either to the jobber or retailer. When you add 20 per cent. to the cost of the goods to the jobber where are you going to squeeze that 35 per cent. in?" I want to hammer that down into the minds of the manufacturers here—that it costs something to do a jobbing business and it costs something to do a retail business. This especially applies to those manufacturers who sell catalogue houses at a controlled price.

A DEMORALIZING STANDARD.

There is another point I want to raise with the manufacturers: Anything that establishes a standard of price affects everybody and in the end must affect the manufacturer himself. A manufacturer wants to make a large quantity of goods, and he makes a very low price to a catalogue house, so that the catalogue house may do a big business; that catalogue house sends out a postal card upon a Single Barrel Gun, for example, making a price of $2.25. What effect is that going to have upon the general trade? The retail dealer is up against that postal card; he brings pressure to bear upon the jobber's salesman to buy those goods cheap. The salesman writes to his house and says he is up against a $2.25 price on a Single Barrel Gun. It means a leveling of prices. If it is true that 95 per cent. of the goods are distributed through

the retailer as against the catalogue house, are you going to level 95 per cent. of your prices on account of 5 per cent.? Now, the injury that the catalogue house does—the great injury it does—is not so much in what it sells as in the standard of prices it is making. Those catalogues are carried into Hardware stores, and while the farmer may buy from the Hardware store, there is the standard price, and that leads the retail dealer to try and buy his goods cheaper and makes the jobber want to buy cheaper.

SPECIAL BRANDS.

This catalogue house question has brought up other questions, among them the question of special brands. Now, in the first place, I think the jobber has suffered somewhat from the attitude of the trade press on the subject of special brands. It should be fully recognized by the trade of the country that most of the advertising is done by manufacturers. It is, therefore, to the interest of the trade press to have just as many manufacturers as possible advertising their own brands in their papers. The jobbers, being represented by a large number of salesmen, who call regularly upon all of their customers, naturally depend upon these salesmen to bring the advantages of their wares, of their special brands, &c., to the attention of the retail dealer.

The jobbers of this country have been very long suffering. They have stood a whole lot, and I hope they will wake up, and not only have social gatherings at their conventions, but do something. One of the prominent jobbers of this country, who has been criticised as the dean of the Hardware trade, said to me one day when he heard that the manufacturers had formed an association: "I knew it was coming. You jobbers have your associations; now the manufacturers have theirs. The difference is that the manufacturers will do something and the jobbers will not." Now I see he was a prophet. I believe the manufacturers are starting to do something and the jobbers have not done very much. With the permission of the manufacturers' asssociation I want to read one of their resolutions that has a bearing upon this subject:

Some of our members, however, claim that the refusal of the manufacturers to sell these catalogue houses will deprive many consumers of the only means of obtaining goods bearing the manufacturers' brands, unless the manufacturers will sell to the consumers direct, which policy the manufacturers as a class are disinclined to adopt. They also claim further, that it will deprive the manufacturers of an important avenue of distributing staple brands and in quantities fully equal to that purchased by many large jobbers.

I will say regarding this that if there was a railroad from St. Louis to Chicago and there was a ticket agent standing at the counter in St. Louis and he was to sell a ticket from St. Louis to Chicago at $7.50, which is the regular rate, and it was advertised in the papers that by writing to another agent you could get the same ticket to Chicago for $6.50, which man would do the most business? That is the catalogue house question.

It has been admitted to me by a prominent manufacturer of a certain line of goods that certain catalogue houses buy their goods 5 per cent. lower than most of the jobbing houses do in the United States. Do you want to kill off the jobber? Now, this is not such a serious matter to the jobbers, in one sense, but how about the retail dealers and small jobbers scattered all over the country? We can manufacture certain lines, just as the catalogue houses are now doing, if we find it profitable to do so.

A great hue and cry has been raised about certain catalogue houses manufacturing certain things they started to manufacture long before the catalogue house question was ever raised. They are out for the stuff, and just as soon as they can manufacture stuff cheaper than they can buy it they are going to manufacture it.

CATALOGUE HOUSES DO NOT MAINTAIN PRICES.

We hear a good deal of talk about catalogue houses maintaining such and such prices. I go on record here and say that they cut every price of every manufacturer who follows the theory of controlling prices. There is a manufacturer here to-day who has been a great advocate of the control of prices who really did not know that ——— were issuing a letter in which they state that to a new customer who will send them an order for $5 or upward they will inclose a draft on themselves for $1 and that $1 will go in part payment on the $5 purchase. That applies to everything in their catalogue and therefore cuts the price 20 per cent. on all goods that they agreed with a certain manufacturer to maintain certain fixed prices on.

Now, the catalogue houses have not only been cutting prices, but they have been working with all the consumers of this country, all the farmers, breeding distrust and dissatisfaction in the minds of the consumers in regard to retail dealers.

INJURING THE JOBBER.

I want to say that I am very sorry indeed to see that the manufacturers of this country—your committee of 19 in these resolutions, which will probably be published in the trade papers—are breeding distrust in the minds of the retail trade of this country against the jobber. You cannot get around it. Here it is:

We desire as far as practicable to co-operate with the merchants of the country by distributing our products through "the avenues of trade" which the Merchants' Association have frequently prescribed as being the ones that they would wish us to follow; but if we abandon all other avenues of trade except the one wherein the jobber becomes practically our sole distributer, and if we permit him to establish and in many places lower the grades and eliminate our names, we sink the individuality and reputation of hundreds of manufacturers representing long experience, great investments and the highest skill, and we believe such a policy will not best serve the interests either of consumers or retailers. With this condition it will be impossible long to restrain many manufacturers from selling through such channels as will carry their own best goods to the consumer. A fair consideration of this subject by jobbers and retailers will greatly aid in solving the problem.

This sort of thing going out to the trade of the country is going to give an impression which will hurt the entire jobbing trade. What will the jobbers do about it?

Now, I want to say with regard to jobbers' brands that there are certain manufacturers who are just as much jobbers as any jobber in the country, although their goods go out under their own brands. These goods are not made by this manufacturer, but are made by other manufacturers. Then, again, certain manufacturers only make parts of certain things. They buy the other parts from other manufacturers. They assemble these parts and put out the goods under their own names and the trade take it for granted that every part of this Tool or other article of Hardware was made by the manufacturer who brands his name on the article. To illustrate: In the Bicycle line one manufacturer makes Tubing; another, Handles; another, Pedals; another, Crank Hangers; but all of these various parts would be assembled in one Bicycle and put out under the special brands of a certain manufacturer, and the trade take it for granted that every part of this Bicycle is made by that one manufacturer. During the World's Fair I was on the Hardware jury. The question was brought up by one of the members of the jury as to what constituted a manufacturer. It was finally decided by the chief of the department of manufactures that whoever assembled various parts and made an article could be classified as a manufacturer, even if he did not actually make any one of those parts. He stated that if it should be held that a manufacturer should make all of the goods sold under his own name it would throw out of competition a majority of the manufacturers who were exhibiting.

JOBBERS WIDER AWAKE THAN MANUFACTURERS.

There is one manufacturer that was really honest with me on the subject. He said to me: "Mr. Norvell, the truth of this matter is that you jobbers in some departments have been wider awake than the manufacturers themselves. You put up goods in nice boxes; you put nice labels on them, and you put them up in small quantities; while my goods have been put up in large quantities, you have been putting them up in fractions of a dozen in some cases. I have been blind; I have not been in touch with the retail trade. Now, I have made up my mind that in the future I am going to imitate the jobber, and my goods are to be put up with first-class labels in boxes and satisfactory to the trade; I am going

to learn from the jobber." Now, there is not a manufacturer in this room or a jobber who does not know that as a general proposition jobbers' special brands are put up better than the manufacturers' brands.

SPECIAL BRANDS NOT ONLY EQUAL, BUT—

I want to go on record for the principal jobbers in this country, who sell the larger proportion of special brands in dollars and cents, that I believe that the special brands of the jobbers are not only equal, but, in the majority of cases, are better finished, are made of more suitable and more improved designs that better suit the mechanic, are put up in better packages and are more conveniently and more attractively labeled than similar goods put on the market by manufacturers, who have been careless and behind the times in attending to these details on their own brands.

THE JOBBERS' RIGHTS.

This is all a question of control. Is the manufacturer not only to have the tariff, the patents and the associations and the Tools, but absolutely own and control the jobbers and the whole trade of the country? The jobbers don't stand up in this meeting and say the manufacturers shall not make their own brands. But the jobbers of the country certainly do maintain their right, when they find a satisfactory manufacturer who is willing to make satisfactory goods for them under the jobbers' brands, to place their orders with such manufacturer. It is our experience that some first-class mechanic who is just starting in business for himself can procure just as good steel, can make just as good and better goods than some old established manufacturer. We claim that this new manufacturer has a right, if he desires, to sell his goods to jobbers to be distributed under the jobber's brand. We claim it is an injustice to this manufacturer for the old established manufacturers of this country, by the resolutions I have just read, to bring discredit upon the quality of the goods made by such a manufacturer and so limit his opportunity to compete with them. It must not be forgotten that many skilled mechanics who are starting in business for themselves give their personal attention to the production of their goods, while in many cases the factories of old established manufacturers are being managed by new men who probably had nothing whatever to do with the manufacture of the goods when their reputation was originally established.

AN EFFORT TO LIMIT COMPETITION.

In other words, I wish to make it just as clear as possible that this assault upon special brands on the part of a limited number of manufacturers is in my opinion an effort to limit the competition they are suffering at the hands of other manufacturers whose greatest drawback is not the quality of their goods, but their lack of capital. If these manufacturers can persuade the trade that only certain old established brands can be depended upon for quality, naturally they knock out these other manufacturers. Allow me to say right here that it is also my personal opinion that the views expressed in the resolutions I have read only represent the opinions of a few manufacturers. I do not take these views as representing the opinions of the great majority of the manufacturers of this country, and as a matter of fact since I have read these resolutions several prominent manufacturers who are present at this meeting have come to me and stated that they were not aware of these resolutions and did not indorse them.

It is a striking fact that some of the manufacturers who are most opposed to special brands never have made them, but they are seriously feeling the competition of other manufacturers who are making special brands. It is also a striking fact that the same manufacturers who have shown the greatest energy in their opposition to special brands are the same manufacturers who are selling most largely to catalogue houses. I also call your attention to the fact that catalogue houses themselves are largely increasing their lines of special brands and that they are being encouraged in this policy by those manufacturers who wish to sell them without suffering the results that will follow the retail trade seeing their goods advertised by the catalogue houses with the manufacturers' names.

In conclusion, let me say, Why don't those manufacturers who are opposed to special brands quit making them? The control of this matter is certainly in their own hands. They don't quit because it goes against their grain to give up any business. They are afraid that this business will go to other manufacturers.

LEAVE IT TO THE RETAIL TRADE.

It seems to me that the question of quality of manufacturers' brands or special brands should be settled by the retail trade who sell the goods and hear the opinions of the consumer. Can we not give the jobber just as much credit for desiring to maintain his reputation on his own goods as the manufacturer? If a jobber's goods are unsatisfactory his salesmen call at short intervals, and will take defective goods off the hands of the retailer, while if the manufacturer's goods are unsatisfactory it is necessary for the retailer to express the items to the manufacturer, and then take his chances of the manufacturer's verdict.

I cannot too forcibly express my opinion that these manufacturers' resolutions are the work of just a few men, and that their main object is to gain a greater control of the market and reduce competition against themselves by creating in the minds of the retail dealers a distrust of the special brands of the representative Hardware jobbers of the country.

EVOLUTION OF THE HARDWARE JOBBER.

BY WILLIAM R. BELKNAP.

After a felicitous introduction, in which he referred to evolution in some of its earlier and broader relations, Mr. Belknap, responding to the toast "The Evolution of the Hardware Jobber," said:

After we have reached the age of man, to say just what the original Hardware dealer or merchant looked like, what he kept and sold, bartered and traded in, how he did it all, how far back in the centuries his root had stuck in the soil—that is the question. I find myself at once in the predicament of the English lord accused of drawing on his imagination for his facts and his memory for his wit—and my memory is very poor at best.

PROCESS OF EVOLUTION.

The primeval Hardware man from whom we have evolved the cultivated, many sided, suave, intellectual, attractive gentleman of to-day, known as the Hardware jobber—what did he look like on week days and when he was decked out for Sunday? Did he get his own sheepskin off the back of the sheep in those days, so that his B.A. was a palpable contraction of B-a-a? Was his daily meat locusts and wild honey, as in the prehistoric wilderness his prophetic eye glanced down through the path of ages made straight thereby? Whatever we may be in doubt about, we know for certain that his Sporting Goods department was the first one to open in the morning, and not with such effeminate toys as Winchester and Stevens put up for us to test our skill on moving targets or empty bottles, but with substantial Axes shaped from granite, and arrow heads from flinty spalls, and slings which bespoke a flight of smooth stones from the brook. The croquet mallets of those days were for tapping your adversary on the cranium with the intent that he should never essay another wicket. Hunting the hairy mammoth or the five-toed horse of the glacial world gave his clients plenty to do, and the boys inside must have worked overtime. But he has left us no record of the prevailing discount on double pointed Tacks, so that it is impossible to say whether or not the special extra 10 was then in vogue.

PROGRESS.

After him came the artificer in bronze. The old stone stock was put on the job table, and no Knives, spear heads, hand mirrors or shields that did not bear a genuine Pompeiian green trademark (see the Metropolitan Museum of Art, New York, in confirmation) could be fairly counted in the profit bearing lines. Much of this stock was, I am persuaded, bought by the more

provident people for the express purpose of burying beneath the surface of the earth for the benefit of future savants and collectors, also to give Russell & Erwin, Yale & Towne, Corbin *et id omne genus*, hints as to color for twentieth century escutcheons and door knobs.

MEDIÆVAL PERIOD.

Then the iron age (I mean the age itself, not the weekly trade oracle) finds this oncoming tradesman among the guilds of Merrie England. They were the cutlers and nailers and sawyers and smiths of every degree. The ironmongers held one of the first places in the Corpus Christi play pageant in the city of York, and, as if in recognition of the goodly fare of these days, some 500 or 600 years later, the scene or tableau assigned to this guild was Simon asking the Lord to enter in and eat with him.

EARLY TRADE REGULATION.

Possibly our best record is of the spurriers, as they unquestionably furnished that which made the mare go. Their articles as drawn in the middle of the fourteenth century read in part as follows:

ARTICLES OF THE GUILD OF SPURRIERS, LONDON, 1345.

In the first place, that no one of the trade of spurriers shall work longer than from the beginning of the day until curfew ring out at the Church of St. Sepulchre without Newgate; by reason that no man can work so neatly by night as by day. And many persons of the said trade, who compass how to practice deception in their work, desire to work by night rather than by day; and then they introduce false iron, and iron that has been cracked, for tin, and also they put gilt on false copper, and cracked. And further, many of the said trade are wandering about all day, without working at all at their trade; and then, when they have become drunk and frantic, they take to their work, to the annoyance of the sick and all their neighborhood, as well by reason of the broils that arise between them and the strange folk who are dwelling among them. And then they blow up their fires so vigorously that their forges begin all at once to blaze, to the great peril of themselves and of all the neighborhood around. And then, too, all the neighbors are much in dread of the sparks, which so vigorously issue forth in all directions from the mouths of the chimneys in their forges. By reason thereof it seems unto them that working by night should be put an end to, in order such false work and such perils to avoid; and therefore the Mayor and the Aldermen do will, by the assent of the good folks of the said trade, and for the common profit, that from henceforth such time for working, and such false work made in the trade, shall be forbidden. Also that no one of the said trade shall hang his Spurs out on Sunday, or any other days that are double feasts, but only a sign indicating his business, and such Spurs as they shall so sell they are to show and sell within their shops, without exposing them without, or opening the doors or windows of their shops, on the pain aforesaid.

Also that no one of the said trade shall keep a house or shop to carry on his business, unless he is free of the city; and that no one shall cause to be sold, or exposed for sale, any manner of old Spurs for new ones, or shall garnish them or change them for new ones.

So you see if the knight were compelled to win his spurs, it is no less true that the spurrier in turn was forced to lose some of his nights.

This, however, is an example of craft guild rather than merchant guild. Still the proper restrictions as laid down here fit so exactly to the ideals of the jobber of to-day that we may feel sure that the lineal descendants of these same spurriers are selling Saddlery Hardware and other Hardware in our own Southern country in this year of our Lord 1905. I have my fears that back in the early days—perhaps only two or three centuries ago—our trade progenitor was a tinker who carried his department store upon his back. No catalogue house ventured competition then. The proprietor delivered his personal guarantee with every Cage, Kettle or Can. Naught could stay the torrent of his speech. The futility of a tinker's dam has been fully recognized and needs no further comment.

THE JOBBER OF HALF A CENTURY AGO AND TO-DAY.

Possibly it is best not to try to deal with conditions too remote, but to come down within the limits of our own memory. I recently heard President Eliot speak on certain educational topics. He declared his only safe ground to be in what he had seen for himself during his 35 years of administration at Harvard, and accordingly dealt with that exclusively instead of stretching our imagination by stories of what had gone on before or gone on elsewhere. Following his worthy example, let us take up the Hardware jobber as some of us knew him 40 or 50 years ago and compare him with his fully evolved successor of the twentieth century. To begin with, his chief boast and title was that of "importer" by reason of the fact that so little Hardware originated in this country that his shelves, willy nilly, groaned under foreign brands. Files, Rasps, Nails and Horse Nails were all in English or German wrappers. It is only a few years since French Wire Nails were the only ones to be had, in seaport towns at least, and it did not occur to him, our jobber in transit, that he would ever be independent of English artisans of Sheffield and Birmingham, or of the German forges of Solingen and Essen. Chains, both coil and halter; Chisels, Bars of Steel and Knives it would have been idle to mark "Made in England" or "Germany," for we knew that they were necessarily made there. The demands of our country were primitive and small and the Hardware jobber's stock comparatively light. He relied, as it were, on Anvils and Grindstones to hold it down. Now, with the ever increasing civilization and wealth, wants multiply and a Hardware stock is of infinite variety, and, moreover, pandering to our national vanity, it is nearly all of domestic manufacture—the Saws, the Shovels, the Nails, the Hammers, Hammerless Revolvers and Guns, Scales and Rails, all our own, made, thank Heaven! in the United States.

DOLEFUL PREDICTIONS.

Besides other bits of cheer he was always being reminded that there was really no use for him, no room for him; that he, the *middle man*, was going to have the breath squeezed out of him between the manufacturer and the dealer. The realization of this prediction has, like the millennium, been postponed from time to time for a more convenient season. Whether it is from being in the middle and getting more or less of animal warmth from those on either side, as did David in his old age, or whatever it may be, he is to-day just as surely among the quick as he ever was. His talents are, we confess, fully employed with "Injuns on the upper road and death upon the lower," but he drives the old coach and four with the same assurance of being able to keep in the middle of the road as securely as any long haired populist. The very fact that his way has been difficult is what has developed his resources. In every community the prominence of the Hardware jobber as a social and civic factor may be noted. It is true that he has been remonstrated with in some quarters because of his wide range of merchandise, but he has gone on developing despite these remonstrances, and, like the Latin philosopher, may now declare, as he turns the pages of his unabridged catalogue, *nihil humani alienum puto.*

PRESENT REQUIREMENTS.

And what must the jobber of to-day be and know? A few, very few, years ago his main qualifications were to occupy with recognized comfortable distension the revolving chair of the general buyer, while his roll top desk looked to have that "full feeling," to relieve which no nostrum had been invented. In a clip, or scattered under all, was the "insoluble residue"—each of us knows what that is or was. The ideal jobber of to-day is one who can read results in ratios and draw significant deductions—essentially the man who selects his help and educates and refines it, while he keeps on learning from it himself.

He must hold such high standards of conduct that not only those who are numbered among his own employees, but others who come in casually as salesmen or callers, shall go on their ways imbued with respect, if not inspired.

He must study the comfort of his employees so that each shall yield his best for the common cause, yet none be overstrained mentally or physically, and none be subjected to deteriorating influences in association that he can prevent. All should go home in the evening better and stronger than they came in the morning.

He must know when to praise as well as to criticise and how to write a letter that buoys up his faltering salesmen or wins a customer inclined to drift away.

He must be a judge of art and an adept in praise lest his advertisement fall flat, for with all his lofty aspiration he is compelled to reckon with the printer's

devil. A press bureau, all his own, is as near an essential feature as anything that can be named.

He must insist on order in his merchandise stock, so that every item may claim its own of space and no more, and so that they who handle shall have the right sort of respect for packages and their contents.

He must study the problems of transportation, so that in his calculations neither coming nor going shall he be undone. He by degrees establishes a basis of credits born of experience and trained judgment adapted specially to the section of country in which he operates, and incidentally he may train into the right path the often misled banking novice of the country town.

He must have a good will for his fellow jobbers, larger or smaller in their scope as the case may be, so that whatever surplus he lays by shall bear no taint of covetousness or unfairness in it.

He must qualify himself to debate the points of order between the retailer and himself with an inclination to the liberal thing at all times, and protect the interests of those who have proved themselves his loyal customers.

He is expected to assist the community in which he lives by taking a leading part in civic betterment. If he is to be the citizen of no mean city he must lend his aid to the end that there are no mean Hardwaremen in it.

In short, he must belong, as President Eliot declares the merchant of to-day ought and does, to the learned liberal professions, and as much to be had in regard for attainments and influence as he who wears a doctor's gown or an attorney's wig, for with him are the issues of intelligent distribution to the advanced needs of his most humble and most exalted fellow men.

INCREASING EXPENSES AND DECREASING PROFITS.

BY R. M. DUDLEY, NASHVILLE, TENN.

This is certainly an easy proposition for the manager if he is not troubled over the disappearance of his original investment. The primary meaning of the word profit is gain above cost. The question naturally arises, What is cost? I take the position that cost is the amount you pay for the goods plus the expense of doing business.

AN OLD BUT IMPORTANT QUESTION.

I am fully aware of the fact that this question of the cost of goods and the question of profit and expenses are old subjects and have been worn threadbare in this association, but this question of cost is one that should be kept prominently before all of us—is my only apology for mentioning it in this connection.

The expense of conducting a wholesale Hardware business has steadily increased for many years, while the opportunities to get a profit seem to have decreased. All will admit, therefore, that it behooves us to watch these matters with an eagle eye. Twenty-five years ago, when I first went on the road as a traveling salesman working the small trade on and off the railroad, the customary price of a meal was 25 cents and the price for staying all night with a horse and buggy was $1. The average price of a meal to-day in the same territory is not less than 50 cents, and for staying all night with a horse and buggy it is never less than $1.50. Only a few samples were carried and a horse and buggy were sufficient to carry them. Now, with a larger amount of samples, a larger catalogue, a horse and buggy are hardly sufficient, so two horses and a driver are more frequently used. It is not surprising, therefore, that instead of our traveling men calling on us for $15 per week for traveling expenses, they are asking for from $25 to $35 in the same territory where $15 was considered sufficient a quarter of a century ago.

The expense of living in cities has been growing greater all the time. It has therefore become necessary to pay larger salaries to bookkeepers, stenographers, shipping clerks, receiving clerks, stock clerks, &c. House rent, insurance and in fact everything seems to be higher except the percentage of profit. I would mention the increase in the rebate and returned goods account, but I do not want to bring up an unpleasant matter.

INCREASE 25 PER CENT. ALL ROUND.

I think I am speaking conservatively when I say that the expenses of conducting a Hardware store have increased since I have been in the business 25 per cent. all around. I mention all these things to emphasize the necessity of making a profit. I am not one of those who considers himself wise enough to conduct a business in such a way as to do an immense volume of profitable business, and with an increased volume reduce the percentage of expenses to almost nothing. If you will leave out the word profitable in the above statement I think I can fill all of the other requirements.

I have mentioned in detail these increased expenses in order to more strongly emphasize the necessity of making a profit. I am unable to suggest any way that expenses can be materially reduced. To get good service you have to pay a good price, and to get suitable quarters in which to conduct your business you have to pay good house rent, &c. To make any money it is absolutely necessary for the gross percentage of profit to be greater than the percentages of expenses of doing business, as both are estimated on the sales. If your percentage of expenses of doing business is 12½ per cent. of your sales and you sell goods at a profit of 12½ per cent. on sales you have made no money. It would, therefore, appear that the all important question is, How to make a percentage of profit in excess of the percentage of expense of doing business.

THERE ARE MANY WAYS IN WHICH WE SHOULD BE ABLE TO MAKE A PROFIT

if our business is a legitimate one. In trying to advance ideas on this subject to the members of the Southern Hardware Jobbers' Association I feel that I am undertaking to carry "coals to Newcastle." In fact, my only idea in the outset was to, if possible, impress upon you more fully the necessity of making an increased profit. It is easy for the manufacturers to make a profit on a line of goods where only two or three men are engaged in the manufacture of the line. They can get together and decide what is a legitimate profit and what percentage of profit they are entitled to, ask it and get it; but where there are a very great number of houses from different cities contesting for the same trade in the jobbing business it is very difficult to formulate any understanding on this character.

The competition in the jobbing Hardware business for many years has looked like a race that would result in the survival of the fittest.

THE ADVICE WE HAVE GIVEN OUR SALESMEN

in selecting and soliciting business is not to push the sale of unprofitable goods, such as do not bear a sufficient profit to cover the expense of doing business. Do not slight the small things—they pay a better profit sometimes than the larger ones. The best profit salesmen always have goods of this kind on every order. A salesman who cannot give his time and attention to the sale of a small article in profitable lines is too busy to succeed on the road. Some salesmen claim that their customers do not handle many Shelf Goods; that they only handle an unprofitable line of goods. I take the position that this is largely the fault of the traveling salesman. If he will make the proper effort he can induce the customer to carry a line of Shelf Hardware and profitable articles, and if he follows it up carefully after selling the customer the goods, and looks after the customer's interest as well as his own interest and that of his house, he will see that the goods are kept nicely displayed and worked off in due course of trade, and usually the customer will be ready on the next trip to give another order for the same line of goods, possibly adding other articles of a similar character, since he has found they are profitable to handle.

A SALESMAN SHOULD PUSH THE PRIVATE BRANDS

of his own house, which will make him both money and reputation. Usually the house has established prices on these goods which pay a reasonable margin of profit above the expense of doing business. It is of course

understood that private brands should be all high grade; no reputable house could think of offering anything else. A salesman should strive to do these things and as an incentive the house should let the size of his check at the end of each month depend upon the amount of net profit which he has obtained during the month.

THE GREATEST DEMORALIZATION IN JOBBERS' PRICES

is caused by one jobber meeting the price of another when he in reality does not know whether the other jobber has made the price or not. He has only heard that he has, and in nine cases out of ten he is meeting an imaginary price. If every jobber would make his own prices and maintain them, independently of everybody else, and in doing so have in mind the percentage of expense of doing business, all the jobbers would make money.

This is the best suggestion that we can offer. Every jobber is entitled to a reasonable return for the capital invested and the effort put forth, and we believe in this way he can get it.

THE CATALOGUE HOUSE QUESTION.

BY R. M. DUDLEY, NASHVILLE, TENN.

The question with which your committee has been grappling is by no means a new one. It is several years since the Hardware trade of the country first began to realize the harmful effect of the competition of mail order houses. When the cloud first appeared it was only a very small one, and the shadow which it cast on the trade was not of sufficient magnitude to occasion any great alarm. Where two or more Hardwaremen met the subject was alluded to, but not given what might be termed serious consideration. The business of mail order houses was not at that time of sufficient importance to be attractive to manufacturers. Some of the large jobbing houses of the North, not realizing the extent to which mail order houses might grow, supplied their daily wants.

The first step to combat the competition of mail order houses was taken by the Hardware associations whose members went on record as believing it would be for the best interest of the trade that they should not sell catalogue houses. This movement was soon joined by many outside jobbers, not members of the association. In the meantime conferences were held between representatives of organized retailers and organized jobbers. Influence was brought to bear on a large number of manufacturers, the result of which was the cutting out of catalogue houses as a means of distributing goods.

BROUGHT HOME TO THE SOUTH.

This subject has not been handled in an aggressive manner at the conventions of this association, mainly because the catalogue houses up to a year or so ago have not been making strenuous efforts to obtain business in the Southern States. To-day, however, the question is brought home to every Hardwareman in our section of the country, be he retailer, manufacturer or wholesaler.

Two of the leading catalogue houses of the country are endeavoring in our Southern daily papers to make connections with the manufacturers who are producing goods in our section of country, in order that shipments may be made direct to the consumer without any disadvantage in connection with freight rates.

No one man, or committee of men, can make a success of this movement. We must have the hearty co-operation of those in whose interest we are working, and I am sorry to have to admit that many of the members of our association do not realize the amount of business they are losing to the catalogue houses. If they would consult their traveling salesmen they would get some information on this subject. It is entirely useless to argue with manufacturers concerning the merits of the question. Those manufacturers who do the largest amount of business with catalogue houses freely admit that not over 5 per cent. of their output is distributed in that way. This being the case, should not these gentlemen promptly consent to respect the express preference of those who distribute 95 per cent. of their product?

We ask that members of the Southern Hardware Jobbers' Association supply themselves with a copy of the catalogues of the mail order houses, ascertain exactly what manufacturers are supplying the catalogue houses, and then open correspondence with these gentlemen, urging them to grant proper protection.

JOBBERS AND RETAILERS MUST CO-OPERATE.

The most serious obstacle now confronting the wholesale and retail Hardware Joint Committee is the want of co-operation on the part of the jobbers and retailers. In an effort to interest the retailers to the correct knowledge of the importance of this proposition we suggest that a letter something like the following be printed and sent to all the members of our association, also possibly to the jobbers located in the North and East, and request the jobbers to include a copy of the letter or circular in all mail going to the retail trade:

CATALOGUE HOUSE COMPETITION.

The deep interest which has so far been manifested by manufacturers, jobbers and retailers on the subject of catalogue house competition indicates its importance. If this method of doing business was not injurious to both jobber and retailer it would not have been given so much publicity. We find a very large proportion of the retailers do not appreciate the very demoralizing influence of catalogue house competition, and looking toward the proper enlightenment of the retail dealers as to the deep and far reaching injury which will result to them by further encroachments of the catalogue houses upon the dealers' business a subcommittee of the Wholesale and Retail Hardware Joint Committee has been appointed, consisting of the undersigned, whose purpose it is to thoroughly agitate this subject among the Southern retail Hardware dealers. We have prepared a very comprehensive treatise on catalogue house competition, setting forth ways and means to combat this evil. This is a very valuable publication and we are anxious to place a copy in the hand of every retail dealer in the South. Copies will be promptly forwarded upon application to any of the undersigned.

C. B. CARTER, Knoxville, Tenn.
M. L. CORFY, Argos, Ind.
R. M. DUDLEY, Nashville, Tenn.

The pamphlet in question could be prepared by the committee and could be made so interesting and effective that great good would result.

In concluding my report I desire to say that my association with the other members of the committee has been very pleasant; certainly no mistake has been made by the other associations in the selection of their representatives on this committee. The success which the Joint Committee has achieved during the past year leads us to be very hopeful of greater success, provided they receive the support of all association men.

THE CATALOGUE HOUSE QUESTION.

BY W. P. BOGARDUS, MT. VERNON, OHIO.

The retail trade stand in the position of the final distributers of the manufacturer's product, and the difficulties that they meet and the questions that they must solve should be of vital importance to both jobber and manufacturer. One of the serious problems that confront the retailer is the competition of the catalogue house, a competition that is immoral and unfair—immoral, because it seeks to secure a monopoly by breaking down all opposition; unfair, by making very low prices on some standard goods, thus seeking to convey the impression that the retail trade are charging excessive prices to the consumer. We do not object to the catalogue houses selling goods. We have no right to do so. But we do object to their methods and the help that they receive from manufacturers who supply them with goods at prices that permit them to undersell the balance of the manufacturer's trade, and so bring disorder and distrust between the manufacturer and the great majority of his distributing agents. That the manufacturer must have distributing agents goes without question. That they must work in harmony is just as apparent.

IF QUANTITY ONLY GOVERNS.

Now if the manufacturer sells his goods, making quantity the only gauge of price, and taking the position that his interest in and control over his output cease when the goods leave his warehouse, then the problem for the retailer becomes more serious, and the downfall

or absorption of the manufacturer draws one step nearer. The giving of prices for quantity alone, regardless of all other considerations, is putting a weapon in the hands of unscrupulous catalogue houses to break down the other trade of the manufacturers and to open the way to a combination that will absorb or control the manufacturing interest of the country.

Do I state this too strongly? In *The Iron Age* of April 27, 1905, you will find the following as a clipping from a Southern newspaper:

> Wanted, to buy the entire output, or part of the output, of Southern factories manufacturing Furniture, Wooden Ware, Agricultural Implements, Machinery, Blacksmiths' Tools, Vehicles, Wagons, Team Harness, Stoves and such other heavy goods as are shown in our catalogue. We want to extend our connection with Southern manufacturers for the accommodation of our growing trade in the Southern States and arrange with manufacturers in all lines to ship direct to our customers on our orders. We are prepared to figure with manufacturers in the various lines for any part or all of their output.

That is to say, the catalogue houses purpose to make the manufacturers of the South their distributing agents; to have them send to any one who orders from the catalogue house a single Stove, a set of Harness, a Wagon or any other article that may be ordered. If this proposition is accepted by the manufacturer of the South, what becomes of the retailer and jobber of the South? To whom will they sell goods? And when the retail trade of the South is broken down and the manufacturers have but the catalogue house for a customer, what will be the prices the manufacturer will get for his output?

EVILS CREEP IN SLOWLY AND FROM SMALL BEGINNINGS.

The private ownership of cars, the secret rebates by railroads, and the accompanying favoritism and consequent ruin of those not in the ring that have resulted in Government investigation and a possible regulation of rates, did not come full fledged into being. The great trusts and combinations that control for their own gain without regard to the effect on others the avenues of commerce, raising and lowering the prices of the necessities of life without regard to the economic conditions of supply and demand, came into existence little by little and their restriction, control or extinction depends on the arousing of a public sentiment that will demand that they play fair or quit.

SPECIAL BRANDS.

When the idea first came to the catalogue house man that by cutting the prices on standard goods a large quantity of unknown goods could be palmed off on the public at good prices, and at the same time doubt and suspicion could be cast on the retail trade, he recognized from the first what the jobber did not, that his success meant the failure of the retailer. At first it was considered good business for the jobber to supply the wants of the catalogue house, and the catalogue house grew apace. The retailer soon discovered that he was being hurt, and that in the house of his friends. He protested with but little success. In the meantime the jobber was learning that the margin on standard goods was getting very small and to recoup himself he went to the manufacturer with the proposition that the manufacturer should make for the jobber a lot of goods that were not to be stamped with the manufacturer's name, but should be stamped with such names and brands as the jobber might select. While the proposition was not entirely satisfactory to the manufacturer, yet in the hope of increasing his business he consented. Other jobbers asked and received the same favors. It was not long until the manufacturer found that he had made a mistake. He was losing his identity, and his own brand of goods was being either sacrificed for or crowded out of the market by special brands. The retailer who at first thought special brands would help him soon discovered that they were not always to be relied on; that while special brands on some goods meant steady reliable goods that could always be counted on, they very often meant everything but steadiness and reliability. For one year the brands were put on by one factory and the next by another factory, because of a lower price and consequent reduction in quality, until the brand meant nothing as to quality but simply that the goods were made up for the jobber whose name they bore. Thus a condition of things has arisen that to the manufacturer is no longer bearable, and all branches of the trade are suffering the evil effects of the movement. The goods that the retail trade have made standard are being used as cat's-paws to palm off inferior goods on the public.

REMEDY WITH THE MANUFACTURERS.

Great evils demand heroic treatment. But some one says, What is the use of bothering? We cannot help the conditions, nor can we change them. Is it true that there is a steady drift toward consolidation that is the outcome of economic conditions that we cannot control? Is it true that the manufacturer is so hampered that he cannot control the prices on his goods? Is it true that the responsibility of the manufacturer for his goods ends when they leave his warehouse? Is it true that under threat of additional competition the manufacturers are bound to conditions that will ultimately break down nine-tenths of their trade and centralize the business in the large cities? Or, is it true that the drift toward consolidation is not the outcome of economic forces over which we have no control, but a fever that will run its course and subside—a fever that has been encouraged by Government aid through the postal law, and by the further hope that the Government would enter more largely into the transportation business, in competition with its citizens, doing the work so cheaply, the taxpayer paying the shortage, that the present facilities, which are not surpassed in any other part of the world, would be broken down? Paternalism should have no place in this country. Government is a political institution, not a business institution. The natural outcome of paternalism is socialism, and socialism leads to the destruction of individual rights and government and morals and religion and the establishment of a reign of terror that would appal humanity.

FROM THE POINT OF VIEW OF A RETAIL MAN

a partial remedy for these growing evils is to realize that business is an avocation by which we earn our living; that success should not be measured by our ability to sell cheaper than our neighbors; that reputations are based on honesty and fair dealing and not on sharp practice and misrepresentation. I would cut out the growing evil of special brands. If the jobber is needed to distribute the manufacturers' goods, and I do not see how he can be dispensed with, let the manufacturer arrange to protect him by giving him prices that will encourage him to handle the manufacturers' standard brands. Discard forever the idea that quantity alone should govern prices. See that retail stores, no matter how much they buy, or under what form or guise they may approach the manufacturer, do not get the prices given the jobber. Protect the jobber and he will protect the retailer, and standard goods will be sold at a profit, and catalogue houses will stand on the same footing as other retail stores stand, and there will be a chance for all of us. There is something radically wrong when some retailers can buy of manufacturers as cheap as jobbers, especially when these retailers do not buy to exceed 10 per cent. of the manufacturers' output. The remedy for this condition of things is in the manufacturers' hands.

RESTRICTED PRICES.

BY W. W. WEBBER, FORT SMITH, ARK.

I feel perfectly secure in the position I shall take here to-day. I believe that a restricted or minimum selling system is the most feasible, satisfactory and profitable method of handling goods, not only for the jobber but for the manufacturer.

I received my early business training in a wholesale grocery house where we had the restricted prices on a number of articles, and my observation was that where we were limited to a certain selling price we made some money, though the per cent. of margin was not at all times satisfactory. During my six years in the Hardware business my experience has been the same, and I dare say has been the experience of every man here to-day.

A DETERRENT TO PRICE CUTTING.

Is the restricted or minimum selling system a deterrent to price cutting? It is, most emphatically, provided the manufacturer is sincere in his work, and will enforce his regulations. The old phrase, "*Humanum Est Errare*," is just as potent to-day as when spoken in the hoary centuries of long ago, and just as true, and no manufacturer need think the simple promulgation of a minimum selling system will constitute his entire work. When he undertakes it he may expect to find that all who handle his goods are not like Cæsar's wife, but that here and there are those who will seek an advantage by lowering the price. But a vigorous policy will soon correct the evil. I am promulgating no new fact when I say that we are handling Poultry Netting, Scale Beams, Horseshoes, Traces, Steel Goods, Nails, Wire, Roofing and Sheets at ridiculously low margins, and sometimes at no margin at all, whereas if we had a minimum selling system backed by people who would enforce it we would be compelled to realize more than we do now. Each of us would feel that we were on a parity with all the others, hence the incentive for price cutting would be minimized, if not in time eradicated.

We would then be put on our mettle as salesmen and business men. There would be a feeling of security in the price made, and I think the margin of profit would improve all along the line. I realize that some of the articles named and others not mentioned cannot be brought under the plan because of the promiscuous manufacture, but I think we should ask that it be done where it is clearly apparent it can be done. I do not think any manufacturer who is in position to put the system into effect will decline to do so when he realizes and must concede that the plan is feasible and is working in many instances. They should, and I believe do, appreciate the soundness of the doctrine that their prosperity depends largely on the prosperity of their customers, that the augmentation of our fortunes means the expansion of theirs, that we travel hand in hand to success or failure and rise or fall together.

THE MANUFACTURER IS DEPENDENT LARGELY UPON THE JOBBER

for the distribution of his product, and his every thought should be toward building up first-class relations with the jobber, protecting him in every way possible, seeking to put him and keep him on a basis where he can prosper by the exercise of ordinary prudence.

The listing of a manufacturer's product may require a great outlay of work and some expense on his part, but in time he will be repaid in knowing he has a satisfied list of customers who delight in putting his goods at the front.

If any of them conclude to meet our views and embark on the plan, let them understand that they cannot hold with the hare and run with the hounds, cannot make fish of one and fowl of another, but must hew to the line irrespective of the man or volume of his business. There is nothing that so hampers a limited price system, nothing that renders it so surely and certainly abortive and useless as for those whose duty it is to enforce it to be guilty of a halting or hesitating policy or playing favorites, as is often done. "I'd rather be a dog and bay the moon than such a Roman."

SOUTH AND SOUTHWEST SHOULD HAVE LARGER MARGIN.

If we succeed in prevailing on even one manufacturer to adopt the system let us give him to understand that we want a plank in his platform as broad as a boulevard and as long as a turnpike, to the effect that whosoever is caught in willful, premeditated violation, with malice aforethought and deliberate intention, and, as the lamented Judge Parker of Arkansas was wont to say, "with a mind fatally bent on mischief," he must walk the plank, and I trust that every jobber here can heartily say, "Them's my sentiments." And, too, we must ask that we be consulted concerning the margin of profit the price will carry. We of the South and Southwest must have a larger margin than is looked for or expected in the North and East. With us we must show our stockholders at least 10 per cent. in dividends, whereas smaller returns are satisfactory elsewhere. The further you get from manufacturing centers the larger must be your capital if you hope to keep your assortment intact, hence we cannot work under as small per cent. as can a dealer who can draw frequently and quickly his supplies. We have to anticipate our wants considerably ahead of the time we need them, because we have the delays incident to all shipments and numerous annoyances unknown to those in close proximity to the centers.

Therefore in making up the selling price we want them to consider that we have to pay for our goods days and weeks and sometimes months before we get them; that to do this and carry a respectable assortment we must have an abundance of capital, which must yield good returns or there is a hiatus in the business. I have devoted considerable thought to this question, and I have had expressions from some of the brainiest men in the association and they are all in support of the plan. It is certainly worth a trial, and if we meet with failure and disaster we are in no poorer condition than now.

It quite frequently happens that the profit bearing qualities of an article become so poor and the sale of it so distasteful to a dealer that he endeavors to curtail the sale of it, and if we all come to the same way of thinking there will be a curtailment and the manufacturer will feel it the first of all. Hence is it not the part of wisdom for him to ascertain and anticipate the wants and needs of his customers, and endeavor to meet their views while he is yet in the hey-day of prosperity.

A WISE MERCHANT OR MANUFACTURER

scans the horizon and takes the temperature of his business just as far ahead as human faculties will allow, and if a squall is looming up and it appears there will be "something doing," he adjusts his rigging to meet it without waiting for it to administer a broadside unawares.

There will be no appreciable curtailment felt because of an article being placed on the limited plan. The increase in the selling price will be nominal, and the retailer will be able to get his usual per cent. of profit. The jobber will get a fair return for the energy and effort put forth, the manufacturer will have a host of contented and amiable customers.

WE HAVE FOUND THAT IT DOES WORK

on some things; then let us now conclude to present a united front in asking for the plan where we by our experience know it is feasible and I believe success will be ours. I fear that unless we ask for the plan we will never get it because it is regarded by some as an innovation and something they prefer to let alone if the movement be left to them. I do not think we should be drastic in our demands or arrogant in our demeanor, but in a lucid, cautious and friendly way point out our needs and fortify our argument with all the data possible. Our progress may be slow and the ends accomplished few, but if we succeed during the next year in having listed just one of the prominent articles our work will not have been in vain.

We must not expect to accomplish all this good by a simple twist of the wrist, nor hope that our *ipse dixit* be accepted as a matter of course. The other fellow must have his day in court; we may expect demurrers to the jurisdiction and motions to dismiss at the cost of the plaintiff. We must have a committee in charge of our interests, if we ever reach that point, who understands the situation and who, after the underbrush has been cut away, will be found on the firing line doing business at the old stand.

This is essentially the age of co-operation—the very air is full of it. There was a time when a big and brainy, forceful and fearless man could map out his own course and construct his own fortune while standing absolutely alone; but in these days of "Frenzied Finance," when every man you see is camping on the trail of the almighty dollar with a persistency born of insatiable greed the very best and ablest must call into service every available force or go down in the maelstrom of defeat and disaster.

THE QUESTION OF FREIGHTS.

As the largest and most important subject discussed at the Hot Springs conventions we give with some fullness what was said in regard to freights, and especially their regulation by legislative enactment. This matter is comprised in the following:

I. Report of the Committee of the Manufacturers' Association.

II. Address of Samuel Spencer, president of the Southern Railway.

III. Remarks by Hon. William H. Taft.

IV. Remarks of Samuel Spencer.

I. REPORT OF FREIGHT COMMITTEE OF AMERICAN HARDWARE MANUFACTURERS' ASSOCIATION.

BY E. BERTRAM PIKE FOR THE CHAIRMAN.

Your chairman, though unable to give this subject but a small portion of the time he would have liked, has for months past given the matter the greater part of his spare time. He has read with much interest many of the articles and speeches representing the railroad point of view, such as those by Presidents Tuttle, Spencer, Wilcox and others; also the excellent articles by members of the Interstate Commerce Commission and others presenting the opposite side of the question, and it does not seem to us that it will be difficult to agree upon some legislation that will be reasonable, satisfactory, and, in the final result, beneficial to both sides. From our point of view it is quite as much in the interest of the railroads as of the shippers and the public at large that reasonable and equitable legislation be enacted at an early date. Without this, or if the railroad interests shall successfully oppose such legislation, it is almost sure that eventually more drastic and paternal legislation will be proposed and supported by an irresistible tide of public sentiment.

The Act to Regulate Commerce contemplates two distinct things:

First. The act provides that carriers shall publish their rates and shall maintain those rates as published without discriminaton between shippers.

The second purpose of the act is to compel carriers to publish a just and reasonable rate.

Now, the first provision of this law has been habitually disregarded. The injunction granted in 1902 and the Elkins bill passed in 1903 have done much to stop the payment of rebates—that is, money rebates—but other devices amounting to the same thing have been substituted, so that the result is almost as bad as, if not perhaps worse than, it formerly was.

IN AMENDING THE LAW AND MAKING IT ADEQUATE

to cover these various devices it would be necessary to arrange for machinery for the enforcement of that law. At the present time there is no way by which the Interstate Commerce Commission or anybody else can obtain evidences of the payment of rebates when such payment is assured. Perhaps this might be accomplished by compelling railroad companies to keep their accounts, both as to the movement of traffic and as to their finances, in accordance with the rules prescribed by the Government, and that these accounts should be at all times subject to Government inspection, and that the duty of enforcing the law should be vested in the Department of Justice.

It appears that at the present six railroad systems control 55 per cent. of the mileage, have 62 per cent. of the gross receipts and constitute two-thirds of the entire railroad capitalization of this country. Thus you see competition exists more in name than in fact, and can no longer be depended upon to prevent excessive rates; the railroads can practically impose whatever rates they may see fit. We believe there should be some tribunal which in a particular case can judge between the railroad and the public. When a railway files its tariff it should be considered presumptively a just and reasonable one, but if the justice or reasonableness of that tariff is attacked there should be, and there must be in fairness to all, some method by which it can be passed upon and by which, if it is found to be unjust, it can be made right. No lawsuit affords the slightest relief, for reasons which you perfectly well understand. The Supreme Court of the United States has decided that the court cannot be invested with the right to prescribe a rate for the future, as this is a legislative function; therefore the only tribunal that can consider such a question and apply a remedy is a tribunal in the nature of a commission. Our belief is, therefore, that you must create a commission or tribunal with power to entertain complaints against unreasonable rates in the published tariff and with power to correct these rates if after hearing them they are found to be wrong.

WHEN THE GOVERNMENT SHOULD STEP IN.

This proposition, you will note, is not for the Government to fix the railway rates of this country; nothing of the kind. We believe that railroads should be allowed to make their own rates. This is a matter of justice to the railroads themselves so long as they are operated by private enterprise. Not only that, but we think it for the interest of the public that railroads should name such rates as they may see fit for the development of their respective lines. It is only when those rates are unjust, discriminating or unreasonably high that the Government should interfere to prevent the wrong.

It seems to your committee, therefore, that, as proposed by the President, the Interstate Commerce Commission should have the power when it finds that a rate which has been complained of is wrong to substitute a right rate in its place, but that the order should be for a specified time only, say, for one year; and perhaps full benefit would be obtained if the railroads were simply compelled to put in effect the rate ordered by the Commission and have the right subsequently to charge this rate like all their other rates. We must assume in these matters that there will be good faith on all sides. The railroads of the country will not wantonly defy the law, and it is just as foolish to assume that they will as it is to assume that a commission or court with that power will confiscate all the railroads of the country.

PRESIDENT HARRISON'S VIEW.

The opinion on this subject of a man so highly respected for his patriotism and legal attainments as the late President Harrison is well worth noting at this time, and we quote from a speech delivered by him in the United States Senate when the original Interstate Commerce bill was under discussion:

What is it the people complain of? What is the just grievance at the bottom of this great popular clamor against the railroad companies? I think, as both these bills admit, just two things: First, extortion, the charging, especially for local freights, of unreasonable rates, thus unduly burdening the local traffic for the maintenance of the railways, and, secondly, and chiefly, discriminations between shippers of the same class. . . .

What is the trouble? It is that the shipper needs to be reinforced in his contest with the railroad companies. If some one should ask me why it is, if the exaction of an unreasonable rate is now unlawful and the excess may be recovered back, that shippers do not recover it back; or if some one should ask me why it is, if discriminations are illegal, that shippers do not expose them and recover their damages, my answer would be that it is an unequal contest to which the shipper is invited.

I think, then, I may declare, with the approval of those who listen to me, that legislation upon this subject to be efficient must reinforce the shipper in his contest with the great railway corporations. . . .

The United States has thrown itself into the scale in behalf of the citizen in this contest. By its own agency, at its own expense, it pursues the inquiry; and when it is closed, if it is found that on a particular day the railroad companies were giving one shipper under the same conditions and circumstances an advantage over another, it places in the hands of the man discriminated against all the facts that enable him to maintain his case. . . .

Then, again, the Commission has the power to get the public ear as the individual shipper has not. It has the power to concentrate public sentiment upon any practice

of the railroad company that is thought to be unjust. Take the humblest man in any of our towns; he cannot make himself heard beyond the village in which he lives; he has no influence; the railroad managers would laugh at him; he is but a pigmy in this contest, and he is contending with giants. But when this great Commission, representing the authority of the United States, composed of able, intelligent men, men of wide reputation, of calm judgment, and without prejudice, looks into the grievance of this humble citizen and says to the railroad companies and the country, "You have practiced an oppression upon that man," the whole country hears the case, and public opinion is concentrated on its condemnation.

WHAT MANUFACTURERS DESIRE.

What we think our members probably demand is, first, fair and equal treatment in respect to railroad rates and transportation; second, stability in the rates, so that the rate cannot only be readily ascertained by shippers, but so that they can rely upon a continuance of the charge for transportation for a reasonable period. The rates should be equal and just, and not enable one man to succeed in business while another fails through no fault of his own. A shipper should know at all times what it would cost him to deliver his goods to any market; that no man is getting any better or any different rate on the same commodity than he is. And should he find or feel that he is being wronged, there should be a tribunal before which his case can be determined. It is a courageous man indeed who will raise a point against a railroad when it is remembered that it is within the power of the railroad to crush him completely if umbrage is taken because complaint has been made.

A COMMUNITY NATURALLY FEARS TO ANTAGONIZE A RAILROAD COMBINATION,

because of the great power of the railroad to ruin its interests. It seems to us that the only proper method is to place the matter in the hands of some tribunal with power to determine, upon complaint, whether the rates are reasonable or unreasonable, such a tribunal to represent the interests of the whole people. The railroads employ an ample corps of attorneys, well equipped to defend the rights of their employers and to deal with all kinds of litigation. The shipper has not this advantage; he cannot generally afford to hire an expensive attorney to conduct his case. And when a shipper whose complaint is filed in his youth dies of old age the disposition of his case is of no use to his business or his widow. We believe the Government should take upon itself the duty of seeing that the interests of the people as well as of the railroads are properly safeguarded.

RECOMMENDATIONS.

In conclusion your committee would recommend the following:

First.—The employment of a traffic manager by the association in conjunction, if it be found practicable, with the National Hardware Association and the Southern Hardware Jobbers' Association, including possibly the American Supply & Machinery Manufacturers' Association.

Second.—The framing of a suitable resolution regarding railroad rate legislation along the lines of conservatism and square dealing.

It would suggest a resolution something like the following:

Whereas, The subject of Interstate Commerce regulation, owing to the enormous growth of power and the seemingly shortsighted methods of certain railroad corporations, has become a vital one in the minds of the American people, claiming the serious attention of all thinking men; and

Whereas, The shippers and the people justly claiming equality of treatment for themselves, and the railroads justly insisting that their own rights should be protected, may all properly unite to bring about legislation which shall be for the best and the lasting interests of all; therefore be it

Resolved, By the American Hardware Manufacturers' Association in convention assembled that the following suggestions looking to a practical solution of present difficulties be laid before the proper committees, and before the Senators and Representatives in Washington generally, as the basis of legislation proper to be enacted in the interests of all.

Resolved, That we favor the active enforcement by the executive department of the General Government of all existing laws to prevent the giving or acceptance of rebates or special favors (through whatever device) to or by favored shippers, and we call upon the Interstate Commerce Commission to apply all the remedies at its disposal, as provided by the original Interstate Commerce act and the Elkins act amending the same.

Resolved, That if the existing laws for the detection and punishment of the giving or acceptance of such rebates are insufficient or defective in any respect, we favor the enactment of such further legislation as may be necessary adequately to deal with the evil and secure its complete prevention.

Resolved, That, in order to carry into effect the provisions of the foregoing resolutions, Congress should be asked for a provision to be made for the necessary examination of the books of the railroad corporations somewhat after the manner of the national bank examinations, for the purpose of detecting and eliminating special favors and discriminations against the small or less favored shippers, and a provision for adequate punishment for improper disclosure of confidential information so gained.

Your committee believes if a measure based on these principles should be enacted by Congress impartial justice would be done to all sides, to shippers and carriers and public alike, and is convinced that under such an enactment litigation on the rate question would be extremely rare, all differences being settled amicably between Commission and railroads without reaching the courts. The shipper would be thus well assured of obtaining what he most needs, a prompt and definite settlement of the charge he must bear, by competent and equitable authority.

II. ADDRESS OF SAMUEL SPENCER.

The invitation which was extended to me to say a few words on this important subject came, as I understood, from the Southern Hardware Jobbers' Association. It does not detract, however, in the least from my pleasure in being here to know I am to have the honor of addressing both of your associations, although what I had intended to say, while possibly applicable to both, was intended specifically for the jobbers' association. I ought also to say that I was unaware that the subject which has been for some months uppermost in the minds of those upon whom the responsibility of railway management rests was to be a specific subject for discussion. I therefore did not attempt to cover the ground as fully as I should had I known that that was the case. I have felt, more, that I was going to meet the jobbers or manufacturers who are engaged in their callings within that territory which I have the honor to specifically represent, and more to exchange civilities and indulge in social intercourse than to discuss earnestly and seriously and specifically the question before us.

The history of this association is typical of that commercial and industrial advancement in the last generation which has given prominence to the position of the Southern States. Your association had its origin in a recognition of the necessity for closer relationship among those engaged in similar pursuits to the end not only of social intercourse, but of that wider knowledge which must follow from the study of the methods and progress of others, whether allies or competitors. Such wider knowledge not only adds to opportunities, but it begets a tolerance in the conduct of business and in personal intercourse which broadens the horizon of the individual and enlarges his capacity for general usefulness.

It is no reflection to say a generation back the cultivation of such broader intercourse and tolerance was one of the prime necessities for commercial progress in the Southern States, and the organization of your association was one of the chief manifestations of a realization of that necessity. During that period—or at least for the last half of it—the material and industrial advancement of the South has been relatively greater, as you all know, than that of any other section

of the United States. In such development co-operation upon the part of all interests has been an important factor. The cotton manufacturers, the owners and developers of iron and coal mines, furnaces and iron mills, and all classes of manufacturers and jobbers have done their several parts in promoting this spirit of co-operation.

ONE OF THE MOST IMPORTANT ELEMENTS IN THE GROWTH OF THE SOUTH

for the last 20 years has been the development of large and efficient systems of railway transportation, these systems taking the place of the small, disjointed units which served only local communities. Without detracting from the importance of any other element in the growth of this great section, which now promises to be among the wealthiest of the country, it is not too much to say that without this development of transportation upon broader lines, co-operating for greater usefulness, that growth could not have taken place, and unless those transportation systems and such others as may be created are financially able to do their part in the future the rich and varied civilization that is before the South must be retarded.

While much has been done, particularly in the last decade, in improving the efficiency of the transportation systems of the South, those systems, unless the signs are all misleading, are still comparatively in their infancy.

Considering for purposes of illustration the four most important railway systems which serve that section east of the Mississippi River:

Their mileage in 1895 was	21,000
Their mileage in 1905 approximately is	31,000
The number of locomotives in 1895 was	3,200
The number of locomotives in 1905 approximately is	5,000
The number of freight cars in 1895 was	95,000
The number of freight cars in 1905 approximately is	190,000

A large proportion of the mileage of 1895 had just emerged from a condition of bankruptcy, during which not only were incomes reduced, but large amounts of invested capital were permanently lost. With a few exceptions the railways of those days, together with the manufacturers and jobbers, were expending their efforts in the struggles that marked the beginning of a new era of business.

THOSE AWAKENED ENERGIES

have caused the merchant, the manufacturer, the jobber to prosper to a larger degree than ever before. An analysis of the figures will show that the increased returns to the owners of transportation lines, however, have been relatively less than to the manufacturer, the merchant and the jobber. The greater demand for cotton, for iron, for coal, for the manufactured articles in which the Hardware jobber deals, has materially increased the price of those commodities. The average price of transportation in the South to-day is less than it was in 1895, and such increase in prosperity as the transportation interests have been enabled to obtain has been made possible only through increased economies due either to larger investment or to the securing of a greatly increased volume of traffic.

It needs not the knowledge of the expert, it is patent in the daily life of all of you, that there remains a further necessity for increased investments in order to produce still greater efficiency for substantially every railway system over which your business is transported. There is not an important railway company in the South to-day that is not earnestly, sometimes anxiously, considering the question of ways and means for making improvements which are absolutely necessary for better service to the public, and therefore for its own success. While moderate sums may be obtained, in some instances from earnings, the only substantial resources for such purposes must necessarily be increased capital secured by loans or by sale of stock. The fundamental requisite for such increased capital, of course, is net earning power of the properties, and unless that net earning power can be shown to be such that the new investment will be secure the means for the enlargement and improvement of the properties to meet the public requirements cannot be obtained.

A NECESSITY NOT FULLY RECOGNIZED.

This necessity for the growth of the transportation business to keep pace with the development of the country has not been and is not to-day fully recognized. That spirit of co-operation which marks your deliberations has not extended as fully as it should have done to the relations between the public and the carriers. It has become a sort of fad to regard the public carrier as a public enemy instead of as a public friend. This is said in no spirit of criticism or complaint; I am free to say the carriers have not been free from fault. For the last seven years in the effort to handle the traffic produced by the increased activity of the South the carrying facilities of every railway system in the South have been taxed at least up to, if not beyond, their physical capacity. Under these conditions every railway officer has necessarily had his attention absorbingly directed to the one purpose of fulfilling as best he could with the facilities at hand the transportation duties imposed upon him. The delays and damages and other burdens growing out of these conditions have been so harassing that these officers have not been able to cultivate that spirit of business intercourse with their patrons which is always necessary to harmonious and beneficial co-operation. The shipper and the carrier have unconsciously and unavoidably drifted apart, possibly neither understanding nor appreciating as he should the position of the other. This situation has become so acute that the carrier has been brought up with rather a sharp turn by the threat that the control of the essential and vital factor in the administration of his business and his property is to be taken from him. A blind sense of some undefined injustice has given rise to an apparent demand that the Government, in exercising its proper function of supervising the public duties of the public carrier, shall go further and direct in detail some of the operations and to an extent determine the earning power of private property.

MODERATE REMEDIAL LEGISLATION?

It has been asserted that the Esch-Townsend bill, which passed the House of Representatives at its last session, would provide only moderate remedial legislation, because it seeks only to grant to the Commission the power not to make rates, but to correct an unreasonable rate, and yet it is a significant fact that at the recent hearings before the Senate Committee not a single member of the Interstate Commerce Commission nor a single advocate of the rate making power for the Commission indorsed that bill. Practically every witness who appeared on that side of the question suggested grave defects in its. Is it moderate remedial legislation to grant a power to correct one rate, when the same tribunal, in attemping in the past to exercise such power, has ordered 2000 rates reduced in one order? Is it moderate remedial legislation to provide that when a rate has been put into effect that the carrier shall have no power thereafter to change that rate to meet a change in commercial conditions? Is it moderate remedial legislation to provide that a decision of seven men at Washington shall name a rate or rates upon any commodity or commodities between any two or more points on the 210,000 miles of railroad throughout the entire United States, and that the rate shall take effect upon their decision alone prior to appeal to the courts, without protection to carriers against loss which must occur pending such appeal in case the courts' decision should be in favor of the carrier? Has there been anything in the history of railway regulation since the passage of the Interstate Commerce act in 1887 which calls for such drastic procedure? Within that period, according to the Interstate Commerce Commission's report, it has had before it 770 formal cases. Of these cases only 45, or only two and one-half per annum, have become the subject of litigation—that is, have been contested in the courts by the carriers. Of this number not a single case of rates unreasonable in themselves has been sustained by the courts, and in only three cases have the courts sustained the findings of the Commission in respect to rates unjustly discriminatory. Is this a situation which calls

for such legislation as would be enacted by the final passage of the Esch-Townsend bill?

EXECUTION OF EXISTING LAWS ONLY NECESSARY.

That there is no necessity for such an unwise and injurious expedient is becoming more and more evident. The evils which have undoubtedly existed as a basis for the demand have been largely diminished and over large areas of this country substantially if not entirely removed. A deliberate and searching inquiry into their existence, with the view to such Governmental remedies as may be required, has been recently conducted by a committee of the Senate, and probably the most conspicuous feature of that investigation, covering a period of six weeks and resulting in testimony covering nearly 2000 pages of printed matter, has been the paucity of well defined and substantial complaints from those having real interests at stake and the almost unanimous testimony that the chief, if not the only, Governmental remedy now required is the vigorous and effective execution of existing laws, with the addition that certain carriers now exempt from the provisions of the law should be brought within its jurisdiction.

This is the result of the application to transportation of those methods of procedure which have characterized your commercial and industrial organization—viz., a free, frank and open discussion of all the questions involved. The carriers have met the questions in the open, have dealt with them in perfect frankness and candor. I say without hesitation that if abuses exist the great majority of the carriers are willing to have the facts known and legal remedies applied. If there are questions between the carriers and the shippers the carriers should invite, and they do invite, a full and frank discussion with those whose interests are immediately involved. If such a policy is adopted on both sides, if a cordial spirit of co-operation is cultivated between those who ship and those who carry, the same results of friendship and fraternity and mutual benefit will follow between them as have followed your efforts since 1893 in building up your useful and successful association.

APPREHENSIVE FOR THE SOUTH.

If there is one section of the country that will be injured more than another by placing rate making power in the hands of a national commission that section is the South. Her coal and iron developments, her miscellaneous manufactures and her jobbing centers are less advanced than those of her Northern sister States. Her ports are with one or two exceptions comparatively undeveloped, and those which are most developed are far behind those where long accumulated wealth, comparatively dense population and better transportation facilities have largely concentrated the commerce of the country. Governmental rate making, however small and insignificant in the beginning, must in the end tend to a tariff rigidity which will retard the development of the less developed sections and perpetuate the supremacy of those which are most securely established.

It has been long admitted by those who knew, and it has been established by evidence in the recent hearings by the Senate committee, that preferences between individuals as to special railway rates have almost, if not entirely, disappeared. The remaining charge, so far as any charge now exists as a basis for railway rate regulation, is the alleged unjust discrimination between sections and communities. This is but one form of the broad question with which you are so familiar, the competition between markets in contradistinction to competition between individuals and firms. The existing competition between markets is most aggressive, and for the welfare of the country it must remain so. It is effectively fostered by all transportation lines in the interest of the special communities which they serve. If a Governmental Commission should undertake to fix rates, and thus establish the relative competitive conditions between communities, the geographical position of each community must be carefully considered by that Commission. Each of the striving communities will be entitled to equal consideration, and the natural drift of the Commission's decisions would be toward mileage rates and the establishment of limited zones of distribution from each manufacturing or jobbing center. The activity of the railway interested in the development of a particular center as against some other not reached by its rails would be gradually eliminated as a factor in the enlargement of that center's horizon of distribution. Compare the effect of this condition on the growing communities of the South with that upon the wealthy, the populous and the long established centers of the Northern States, and ask yourselves as patriots and as shippers whether it is to the interest of yourself or your friends or of your States or cities that a Commission at Washington shall have power to decide upon the number of miles from your place of business within which you shall be allowed to distribute your products.

The tremendous cotton mill development in the South was possible in competition with the established mills of the North only by reason of the adjustment and reduction of railway rates that enabled the Southern mills to sell their products in Northern and foreign markets. A case is now pending before the Interstate Commerce Commission in respect to relative adjustment of rates on cotton mill products in which it is urged that the existing rates from certain Southern mills shall be raised because those mills are enabled to compete with other mills that claim the right of territorial monopoly against the Southern manufacturer.

The development of the iron industries of Alabama and Tennessee was made possible only by the making of low freight rates from those regions to the portions of the country where iron and its products are consumed in largest quantities. These markets had been supplied by the highly developed and prosperous iron industries of Pennsylvania and Ohio, which lie much nearer to the regions of largest consumption than do the iron fields of the South.

Rates upon raw materials necessary for the operations of the Alabama furnaces were made unprecedentedly low in order that those furnaces might be built, might continue to run at low cost, compete in distant markets and build up a trade against powerful competitors already strongly intrenched in wealth and resources and situated nearer the established markets. When those furnaces were established there was no nearby market for their products.

PROMPT ADJUDICATION OF QUESTIONS AT ISSUE.

Much stress has been laid in recent discussions of this absorbing subject of Governmental rate making upon the necessity for the prompt adjudication of questions at issue between the shippers and the carriers. In support of the argument that a decision as to the reasonableness or unreasonableness of a given rate should be made effective by the Commission prior to review by the court, the long delays between the bringing of the complaint and the reaching of final conclusions have been cited. An examination of the record shows that the unnecessary delays have occurred chiefly in the proceedings of the Commission itself. To meet this very objection of long delay was passed the Elkins law of 1903, which provides that the Commission can summarily appeal to the court, that the court shall have power to enjoin any unreasonable or any unjust or discriminatory rate or practice, that the trial of the cause shall have precedence in the Circuit Court over all other than criminal cases, and that in case of appeal the appeal shall be direct from the Circuit Court to the Supreme Court of the United States. This process is as summary as it is possible to devise under any system of orderly and equitable judicial procedure. No man and no corporation should be adjudged guilty without such procedure, and the time required therefor cannot under a free Government be pleaded as an excuse for conviction and punishment without trial. To give a body which is not a court the power to both decide judicial questions and to execute its own findings is to provide by statute for the enforcement of lynch law.

AN UNSUPPORTED CLAIM.

It has been claimed that it is not proposed to grant a general rate making power to the commission, but only the power to correct an unreasonable or an unjustly discriminatory rate after complaint and hearing. In al-

most all of the arguments presented on the subject, and in the Esch-Townsend bill, which passed the House of Representatives at its last session, the term "a rate," and not "rates," has been used. In almost every case in which the Interstate Commerce Commission has attempted to exercise the power now sought the opinion of the Commission has involved a multitude of rates instead of a single rate. In the famous Maximum Rate Case the number which would have been affected had the decision of the Commission been sustained would have been over 2000, and the effect of that one decision would have been to revolutionize, not to say destroy, the entire rate making basis from the principal cities east of the Mississippi and west of Pittsburgh and north of the Ohio River to all points in the South, and in turn this would have compelled a readjustment of substantially all the rates from New England, New York and Pennsylvania to same points of destination in the South. This decision of the Commission was promulgated at a time when over 50 per cent. of all the railroads in the Southeastern States were in the hands of receivers, unable to earn their fixed charges, and under necessity of complete financial reorganization at enormous loss to their owners. The decision, if it had become effective, would have prevented the resuscitation of those properties upon the present sound financial basis, and would have indefinitely postponed, if not rendered impossible, the subsequent rapid development of the transportation interests of the South, which has been essential to the great industrial growth and prosperity of the Southern States in the past decade. When the order of the Commission was promulgated such reduction meant ruin to the carriers, but with the increased volume of business and the increased efficiency of the resuscitated carriers the play of the natural laws of trade and commerce has led to an equitable reduction in those rates. This has been accomplished after consultation between the carriers and the several communities without violence, without disaster to any interest and without commercial disturbance in other sections such as would have followed the arbitrary action of a Governmental tribunal.

This entire question of relationship between the National Government and the carriers is one of vital interest to the Southern States and to those who are engaged in the further development of their commerce and industry. It is one which should be studied by every merchant, every manufacturer and by every voter. If the Gulf and South Atlantic ports are to develop an export and import trade, if the growth of the manufactures of the South and the development of her natural resources are to continue, the owners of the transportation systems of that section must be permitted to continue to exercise a reasonable judgment and discretion promptly in meeting market and commercial conditions as they arise without recourse to the slow process of Governmental hearings. This is not only a commercial necessity for both the carrier and the shipper, but it is equitable and fair, at least until there is substantial evidence of a misuse of that discretion, and after a searching investigation no such evidence has yet been produced.

III. REMARKS OF HON. WILLIAM H. TAFT.

The vote of thanks to Mr. Spencer for the very able address on the subject of railway rates I am sure you gave with unanimous consent. I am sorry to say that my gracious consent to indulge in the discussion of railway rates did not have a similar foundation. I came in here at the solicitation of your very enticing advance agent, Mr. Lupton, to listen to Mr. Spencer, and, as Mr. Lupton said, to say just a few words in farewell and in thanks for the very great pleasure which you have given me in the last two days—to be one of your number and to take part in a magnificent banquet last night. I did not intend to indulge in the discussion of railway rates. It is a matter which I have given more or less consideration. I cannot claim the detailed and technical consideration of Mr. Spencer, and with respect to which upon some details possibly more or less important I have reached a different conclusion.

I first wish to congratulate the members of the Southern Hardware Jobbers' Association and all the business men of the South that they have had at the head of the most important railway system of the South a gentleman of the integrity, of the experience and of the moderation of Mr. Spencer, and if anything could make me doubt my conclusion with respect to the wisdom of the proposed legislation of the Esch-Townsend bill it would be Mr. Spencer's opposition. The truth is I feel like saying with respect to Mr. Spencer that we are old railroad men together. I had the pleasure at one time, while Judge of the United States Court, of appointing the receiver and directing the movements of the receivers—for there were a number of them who had to do that work that Mr. Spencer now does himself—for the East Tennessee, Georgia, Cincinnati Southern and a great many other roads that go to make up the present Southern Railway system, and during that ten years of what might be called the burial and revival of the railroads of that region it became my duty to sit in a number of cases arising under the Interstate Commerce law. Now, Mr. Spencer has said, and has said truly, that under the last Interstate Commerce law it was possible to unite, and is possible under the existing Interstate Commerce law to unite, under the discussion of a great many rates. He has instanced the Maximum Rate case, because he says if it had been carried to effective decision it would have influenced 2000 different rates. I am not familiar with that case, doubtless as Mr. Spencer is, but I venture to think that the reason why that was the case was that the rates all involved the same question—something with reference to the arbitrary or differential south of the Ohio River, and it was proper and is proper under any system where a number of cases present the same question—it is in the interest of expedition in settling issues—that they should all be brought together, so that the decision of one by the court can end the contest. But speaking generally of the old system, the Esch-Townsend bill does not at all affect the old system, for there is nothing in the Esch-Townsend bill, if you will read it, that speaks of how many cases may be united in one. Under the old system generally the cases presented involved only one complaint or two complaints or three complaints, growing out of practically the same question of discrimination.

The Esch-Townsend bill does three things: It provides, first, that the tribunal which is to consider the question of rates will say, not only that a rate is unreasonable, but may say authoritatively to the parties who are to be influenced by that decision what is a maximum reasonable rate. It is possible that the mind can decide that a rate is unreasonable without the mind reaching a conclusion as to what a maximum reasonable rate is, but I cannot in my mind. In order to determine that a rate is unreasonably high you must take, it seems to me, logically in your mind what is reasonably high—that is, what a maximum reasonable rate is. Now, under the existing system the tribunal or the court says this rate of 5 cents is an unreasonable rate and a maximum reasonable rate is 3 cents. They order you to put on a reasonable rate. Under that order the company does not violate the order, although the court or tribunal indicates what it thinks is a reasonable rate. If the company reduces the rate from 5 cents to 4½ cents and you then desire to remedy what you regard as that abuse, you have to go into the court again and have that pronounced an unreasonable rate, and so on down until you get to the 3 cents which the court thinks is reasonable. Now, as business men, as looking at the thing from the ordinary standpoint, is it not the true method? Is it not the just method that the court, in enjoining you from fixing an unreasonable rate, should say and give a guide as to what is not only an unreasonable rate, but anything over and above 3 cents is an unreasonable rate, and therefore you ought to come down to 3 cents. Now that is one thing in the Esch-Townsend bill.

The second thing it does is to make the action of the tribunal *prima facie* evidence of its justice—we must not assume that that tribunal because it is not an administrative tribunal is necessarily an unjust tribunal. If this present Interstate Commerce Commission has so

become imbued with fanaticism that it wants to destroy the railroads of the country then abolish the Interstate Commerce Commission and then put in a new Commission—a Commission that can be trusted to do justice between the railroads and the public, and be able from constant acquaintance with the question to deal with it intelligently and it can say, after looking the situation over, that this rate is an unreasonable rate—that a reasonable rate is 3 cents—the railroads, on reversal of the decision could recover back by being protected with bonds or some other method—that is only a question of detail. But the principle is that the order should be effective when those gentlemen charged with the duty, as you may say, say that such and such a rate is a maximum reasonable rate that shall be effective until the railroad should go into court and show either primarily or finally by a hearing that that ruling is not correct. Now, what is going to be the effect of that—and we are dealing with practical questions of legislation? That has the effect of throwing the burden on the railroad and they call for a hearing or an injunction and the case comes up and is disposed of promptly.

Another remedy of the proposed bill is that under the present system the railroads were in the habit of making a small showing when called upon by the Interstate Commerce Commission; they did not bring in all their evidence. They would say: "Oh, this is not important—just let is go by default, and we will put in our evidence afterward in the court." The result was that in many cases the Interstate Commerce decisions are on an entirely different state of facts from the decision in the courts, and that was one of the reasons—and the chief reason, I may say—why in the record which Mr. Spencer cites so many cases decided by the Interstate Commerce Commission were reversed in the courts—because the railroads did not make their full case before the Interstate Commerce Commission.

In conclusion Secretary Taft expressed the opinion that Mr. Spencer was frightened by a ghost as to what is going to happen if the present law is changed. The Esch-Townsend bill can be modified if it needs some qualification, but something must be done to remedy the defects of the present Interstate Commerce law and satisfy the public demand for some remedy in order that this thing shall not grow and grow and grow until we have extreme remedies which we will all deplore.

IV. REPLY OF PRESIDENT SPENCER.

Mr. Spencer said in the first place he wanted to disabuse Secretary Taft's mind of the idea that he was "frightened at a ghost"; that the railroads have long since ceased to fear ghosts. He expressed the opinion that the railroads wanted to do what was fair and proper; that the railroads disavowed the claim made that they were occupying an obstructive position, but on the other hand that they desired a full and free discussion of the question of railroad rates. He said that Secretary Taft must be mistaken in some of the conclusions he had reached. The first step suggested by Secretary Taft—that should the Interstate Commerce Commission adjudge a rate as unreasonable it should then proceed to name a reasonable rate, which should immediately go into effect—he said that the first step under our law was distinctly a judicial question, and the question being purely a judicial one, should not be effective until passed upon by the judiciary. Mr. Spencer said that if the Esch-Townsend bill was carefully read it would be found to say, not that the Commission shall establish a maximum rate, but that it shall establish an absolute rate and that that rate shall remain in effect for all time unless modified by the courts or the Commission itself. Out of over 700 cases passed upon by the Interstate Commerce Commission there were but 45 in which the decision of the Commission was not acquiesced in by the railroads.

In reference to the suggestion made that the policy of the railroad companies was to make only fractional reductions in rates or technical reductions when an order was made by the Interstate Commerce Commission for a reduction in rates, Mr. Spencer said that that had never been the policy of the railroads and would not be in the future. He did not believe that 1 per cent. of the railroads of this country or the railroad managers would take such action.

Mr. Spencer claimed that the Interstate Commerce Commission now has the power to take any case it desired directly into the United States Circuit Court for adjustment. There had not been a year since 1897 that there had not been a large number of cases in which the decisions or the opinions of the Interstate Commerce Commission with respect to those questions had gone absolutely into effect by consent; that they went into effect because the carriers on the one hand felt that they did not want to contest them, and, on the other hand, it was considered good transportation business and that the parties making complaint had made a fair case. At the late hearing before the Interstate Commerce Committee of the Senate there was an almost entire absence of specific, well defined complaints on any subject.

In conclusion he said the position of the carriers was simply that this question, which is vital to them and which, in his opinion, was vital to this country, more so probably than any other one industrial question now before them—that that question shall be sifted to the bottom, and that nothing shall be taken for granted about it, and that there shall be a perfectly free discussion in every forum in this country, and at least in the forum of public opinion, which at last settles all these questions.

THOSE IN ATTENDANCE.

J. C. Sproull, Anniston Hardware Company, Anniston, Ala.
J. D. Moore, Moore & Handley Hardware Company, Birmingham, Ala.
T. G. Ewing, Ewing Hardware Company, Gadsden, Ala.
H. M. Price, H. M. Price & Co., Mobile, Ala.
W. M. Teague, Teague & Sons, Montgomery, Ala.
Ben J. Schuster, Ben J. Schuster, Selma, Ala.
M. P. Jemison, Allen & Jemison Company, Tuscaloosa, Ala.
F. B. Dunlop, Speer Hardware Company, Ft. Smith, Ark.
W. W. Webber, Webber-Ayers Hardware Company, Ft. Smith, Ark.
Jas. J. Mandelbaum, Fones Bros. Hardware Company, Little Rock, Ark.
J. Van Dokkum, Fones Bros. Hardware Company, Little Rock, Ark.
H. C. Fox, Fox Brothers Hardware Company, Pine Bluff, Ark.
S. B. Hubbard, Jr., the S. B. Hubbard Company, Jacksonville, Fla.
W. B. Jackson, the Athens Hardware Company, Athens, Ga.
W. M. Crumley, Beck & Gregg Hardware Company, Atlanta, Ga.
R. M. Crumley, Beck & Gregg Hardware Company, Atlanta, Ga.
S. C. Dinkins, Dinkins & Davidson, Atlanta, Ga.
George E. King, King Hardware Company, Atlanta, Ga.
Chas. P. King, King Hardware Company, Atlanta, Ga.
Deveney, Hood & Co., Augusta, Ga.
F. L. Scott, Scott Hardware Company, Paducah, Ky.
S. H. Brown, Oklahoma City Hardware Company, Oklahoma City, O. T.
George G. Weaks, Monroe Hardware Company, Monroe, La.
Col. B. F. Eshleman, Stauffer, Eshleman & Co., New Orleans, La.
S. Eshleman, Jr., Stauffer, Eshleman & Co., New Orleans, La.
C. G. Wright, Wright Bros. Hardware Company, Vicksburg, Miss.
Charles R. Wright, Wright Bros. Hardware Company, Vicksburg, Miss.
Charles H. Ireland, Odell Hardware Company, Greensboro, N. C.
H. W. Powers, Mitchell-Powers Hardware Company, Bristol, Tenn.
Wm. J. Fickle, Virginia-Tennessee Hardware Company, Bristol, Tenn.
Bruce Keener, C. M. McClung & Co., Knoxville, Tenn.
B. M. Gladding, E. C. Atkins & Co., Memphis, Tenn.
N. Benedict, Benedict, Warren & Davidson Company, Memphis, Tenn.
G. S. Davidson, Benedict, Warren & Davidson Company, Memphis, Tenn.
H. R. Miller, Thomas, Barnes & Miller, Memphis, Tenn.
J. H. Schumacher, Bering-Cortes Hardware Company, Houston, Texas.
Spencer James, Piedmont Hardware Company, Danville, Va.
O. B. Barker, Barker-Jennings Hardware Company, Lynchburg, Va.
W. D. Stuart, Richmond Hardware Company, Richmond, Va.
John Donnan, the W. S. Donnan Hardware Company, Richmond, Va.
J. W. Ruff, Bluefield Hardware Company, Bluefield, W. Va.
C. B. Carter, secretary Southern Hardware Jobbers' Association, Knoxville, Tenn.
Samuel A. Bigelow, president National Hardware Association, Boston, Mass.
T. James Fernley, secretary-treasurer National Hardware Association, Philadelphia, Pa.
W. P. Bogardus, president National Retail Hardware Association, Mt. Vernon, Ohio.

M. L. Corey, secretary National Retail Hardware Association, Argos, Ind.
C. H. Miller, president National Hardware Mutual Fire Insurance Company, Huntington, Pa.
William R. Belknap, Belknap Hardware & Mfg. Company, Louisville, Ky.
S. Norvell, Norvell-Shapleigh Hardware Company, St. Louis, Mo.
W. W. Supplee, Supplee Hardware Company, Philadelphia, Pa.
J. S. Bonbright, Supplee Hardware Company, Philadelphia, Pa.
Daniel Stern, the *American Artisan*, Chicago, Ill.
Walter F. Wallace, the *American Artisan*, Chicago, Ill.
A. Eugene Bolles, *Hardware*, New York City.
H. H. Roberts, *The Iron Age*, Philadelphia, Pa.
R. R. Williams, *The Iron Age*, New York City.
Max I. Barth, the *Tradesman*, Chattanooga, Tenn.
Harry Wise, the *Tradesman*, Chattanooga, Tenn.
Chas. M. Luthy, the Columbus Hardware Company, Columbus, Ohio.
R. D. Carver, Alabama Steel & Wire Company, Birmingham, Ala.
E. R. Philip, American Can Company, Atlanta, Ga.
J. A. Carter, American Fork & Hoe Company, Cleveland, Ohio.
F. S. Kretsinger, American Fork & Hoe Company, Cleveland.
F. D. Mitchell, secretary-treasurer American Hardware Manufacturers' Association, New York City.
W. H. Foege, American Steel & Wire Company, Chicago, Ill.
J. J. Gilmore, American Steel & Wire Company, Chicago, Ill.
H. R. McCue, American Steel & Wire Company, Chicago, Ill.
Hobart Ames, Ames Shovel & Tool Company, Boston, Mass.
S. S. Early, Oliver Ames & Sons Corporation, North Easton, Mass.
Charles H. Myers, Ames Shovel & Tool Company, Boston, Mass.
N. A. Gladding, E. C. Atkins & Co., Indianapolis, Ind.
F. Herbert Smith, E. C. Atkins & Co., Indianapolis, Ind.
B. M. Gladding, E. C. Atkins & Co., Memphis, Tenn.
Clyde L. King, Atlanta Agricultural Works, Atlanta, Ga.
Wm. Black, B. F. Avery & Sons, Louisville, Ky.
James H. Marshall, Baeder, Adamson & Co. Chicago, Ill.
Jos. M. Hottel, G. & H. Barnett Company, Philadelphia, Pa.
Henry H. Beers, Beers & Mitchell, Richmond, Va.
Guy Mitchell, Beers & Mitchell, Atlanta, Ga.
S. G. Gilfillan, Belfont Iron Works Company, Ironton, Ohio.
John R. Gilfillan, Belfont Iron Works Company, Ironton, Ohio.
Clement M. Biddle, Biddle Purchasing Company, New York.
H. Blacklock, Blacklock Foundry, South Pittsburg, Tenn.
Jno. M. Berry, Bowie Stove Company, Rome, Ga.
Lewis R. Hardy, Brinly-Hardy Company, Louisville, Ky.
George E. Holton, Bryden Horse Shoe Company, Catasauqua, Pa.
D. K. Stucki, Buffalo Forge Company, Buffalo, N. Y.
Wm. K. Stone, Cambria Steel Company, Atlanta, Ga.
Frank R. Blauvelt, R. K. Carter & Co., New York City.
Alfred Greening, R. K. Carter & Co., New York City.
H. P. Chenoweth, Birmingham, Ala.
W. A. Chenoweth, Birmingham, Ala.
E. G. Buckwell, the Cleveland Twist Drill Company, Cleveland, Ohio.
G. W. Jeffords, Columbian Enameling & Stamping Company, Columbus, Ohio.
Geo. L. Haven, P. & F. Corbin, New Britain, Conn.
G. L. Corbin, Corbin Cabinet Lock Company, New Britain, Conn.
Geo. W. Corbin, Corbin Cabinet Lock Company, New Britain, Conn.
C. M. Griswold, Corbin Screw Company, New Britain, Conn.
Thos. E. Parnell, Crucible Steel Company, Chattanooga, Tenn.
George F. Dana, the Dana Mfg. Company, Cincinnati, Ohio.
Frank M. Snook, the Dana Mfg. Company, Cincinnati, Ohio.
L. W. Stewart, the Dana Mfg. Company, Cincinnati, Ohio.
Geo. S. Parkes, E. I. DuPont Company, Birmingham, Ala.
H. B. Plumb, Eagle Lock Company, New York.
L. C. Frazer, Birmingham, Ala.
Robert Garland, Garland Nut & Rivet Company, Pittsburgh, Pa.
Alfred Sang, Garland Nut & Rivet Company, Pittsburgh, Pa.
A. W. Bond, Goodell Company, Baltimore, Md.
Ex-Governor D. H. Goodell, Goodell Company, Antrim, N. H.
R. C. Goodell, Goodell Company, Antrim, N. H.
James C. Griffin, the Griffin Mfg. Company, Erie, Pa.
Robert M. Lee, the Griffin Mfg. Company, Erie, Pa.
Jos. L. Hemp, Hemp & Co., St. Louis, Mo.
E. E. Perry, the Hopkins & Allen Arms Company, Norwich, Conn.
Thomas O'Brien, the Hopkins & Allen Arms Company, Norwich, Conn.
J. H. Grubb, Hussey, Binns & Co., Philadelphia, Pa.
J. T. Rader, the International Cutlery Company, Fremont, Ohio.
T. W. Gathright, C. E. Jennings & Co., Atlanta, Ga.
Frank I. Clark, Iver Johnson's Arms & Cycle Works, Fitchburg, Mass.
Chas. P. King, American Iron & Steel Mfg. Company, Atlanta, Ga.
J. P. Kelly, Kelly Axe Mfg. Company, Charleston, W. Va.
George T. Price, Kelly Axe Mfg. Company, Charleston, W. Va.
A. E. Welti, Keuffel & Esser Company, New York City.
Felix Bahlmann, the Kruse & Bahlmann Hardware Company, Cincinnati, Ohio.
W. H. Bennett, Lawson Mfg. Company, Chicago, Ill.
Mahlon H. Marlin, the Marlin Fire Arms Company, New Haven, Conn.
Joseph J. McCaffrey, McCaffrey File Company, Philadelphia, Pa.
W. A. Corry, J. C. McCarty & Co., New York City.
C. M. King, McKinney Mfg. Company, Allegheny, Pa.
J. P. McKinney, McKinney Mfg. Company, Allegheny, Pa.
O. C. Mead, Mead & Smith, Louisville, Ky.
W. P. Smith, Mead & Smith, Rogersville, Tenn.
H. A. Curtiss, Meriden Cutlery Company, Meriden, Conn.
C. F. Forsyth, Meriden Cutlery Company, Meriden, Conn.
V. A. Moore, Atlanta, Ga.
George H. Harper, National Enameling & Stamping Company, Baltimore, Md.
Geo. W. Knapp, National Enameling & Stamping Company, Baltimore, Md.
W. H. Matthai, National Enameling & Stamping Company, Baltimore, Md.
Harry D. Harvey, the National Supply Company, Baltimore, Md.
Louis G. Beers, the New Jersey Wire Cloth Company, Trenton, N. J.
Wallace L. Pond, Nicholson File Company, Providence, R. I.
A. C. Albrecht, North Bros. Mfg. Company, Philadelphia, Pa.
George T. Oliver, Oliver Iron & Steel Company, Pittsburgh, Pa.
Henry B. Lupton, Oliver Iron & Steel Company, Pittsburgh, Pa.
T. H. Gossett, Peck, Stow & Wilcox Company, New York City.
J. S. French, Peters Cartridge Company, Cincinnati, Ohio.
T. H. Keller, Peters Cartridge Company, Cincinnati, Ohio.
W. E. Keplinger, Peters Cartridge Company, Cincinnati, Ohio.
F. C. Tuttle, Peters Cartridge Company, Cincinnati, Ohio.
E. Bertram Pike, Pike Mfg. Company, Pike, N. H.
Herbert E. Smith, Pike Mfg. Company, Pike, N. H.
A. P. Shirley, Pittsburgh Steel Company, Pittsburgh, Pa.
Wm. Taylor, Pittsburgh Steel Company, Pittsburgh, Pa.
Fayette R. Plumb, Fayette R. Plumb, Incorporated, Philadelphia, Pa.
J. J. Teeple, Fayette R. Plumb, Incorporated, Philadelphia, Pa.
Howard L. Boas, Reading Hardware Company, Reading, Pa.
Albert A. Gery, Reading Hardware Company, Reading, Pa.
George R. Harbster, Reading Hardware Company, Reading, Pa.
J. E. Harbster, Reading Hardware Company, Reading, Pa.
Mathan Harbster, Reading Hardware Company, Reading, Pa.
T. B. Hendrickson, Reading Hardware Company, Reading, Pa.
G. N. Jacobi, Reading Hardware Company, Reading, Pa.
W. R. Johnson, Reading Hardware Company, Reading, Pa.
R. Luerssen, Reading Hardware Company, Reading, Pa.
J. C. McDonald, Reading Hardware Company, Reading, Pa.
O. Milligan, Reading Hardware Company, Reading, Pa.
John G. Mohn, Reading Hardware Company, Reading, Pa.
Wm. G. Mohn, Reading Hardware Company, Reading, Pa.
C. S. Packard, Reading Hardware Company, Reading, Pa.
S. Y. Reigner, Reading Hardware Company, Reading, Pa.
Nathaniel Rhoads, Reading Hardware Company, Reading, Pa.
S. B. Richards, Reading Hardware Company, Reading, Pa.
F. A. Schumacher, Reading Hardware Company, Reading, Pa.
I. G. Treat, Reading Hardware Company, Reading, Pa.
Geo. E. Tyson, Reading Hardware Company, Reading, Pa.
B. A. Hawley, Russell & Erwin Mfg. Company, New York.
S. B. Bispham, Russell & Erwin Mfg. Company, New York City.
Al. L. Sisson, Russell & Erwin Mfg. Company, New York City.
Frank Guildener, Sargent & Co., New York City.
A. W. Peck, Sargent & Co., New York City.
Geo. H. Sargent, Sargent & Co., New York City.
Geo. F. Weipert, Sargent & Co., New York City.
J. C. Birge, St. Louis Shovel Company, St. Louis, Mo.
Walter Birge, St. Louis Shovel Company, St. Louis, Mo.
O. S. Decker, Sligo Iron & Steel Company, Pittsburgh, Pa.
Geo. B. Whiteside, Southern Plow Company, Columbus, Ga.
Robert N. Peck, Stanley Rule & Level Company, New Britain, Conn.
James Powell, Stanley Rule & Level Company, New Britain, Conn.
A. W. Stanley, Stanley Rule & Level Company, New Britain, Conn.
Fred. S. Merrick, Standard Horse Nail Company, New Brighton, Pa.
R. T. Lane, the Standard Tool Company, Cleveland, Ohio.
D. P. Hale, Standard Wheel Company, Sandersville, Ga.
F. E. Muzzy, J. Stevens Arms & Tool Company, Chicopee Falls, Mass.
C. E. Roberts, J. Stevens Arms & Tool Company, Chicopee Falls, Mass.
H. A. Dean, the Towers & Sullivan Mfg. Company, Rome, Ga.
J. B. Sullivan, Jr., the Towers & Sullivan Mfg. Company, Rome, Ga.
T. F. Connors, the United States Hoe & Tool Company, Columbus, Ohio.
B. F. Hadley, the United States Hoe & Tool Company, Columbus, Ohio.
Jno. E. Avery, Union Metallic Cartridge Company, Atlanta, Ga.
John S. Sanders, Union Metallic Cartridge Company, Atlanta, Ga.
H. G. Reinicker, Warren Edge Tool Company, Baltimore, Md.
George P. Wier, Wier Bros., Baltimore, Md.
Charles H. Wier, Wier & Wilson, Baltimore, Md.
Irby Bennett, Winchester Repeating Arms Company, Nashville, Tenn.
Frank G. Drew, Winchester Repeating Arms Company, New Haven, Conn.
George L. Knight, Wyoming Shovel Works, Nashville, Tenn.
N. G. Robertson, Wyoming Shovel Works, Wyoming, Pa.
J. B. Parrent, Yale & Towne Mfg. Company, Atlanta, Ga.
Geo. D. Kirkham, American Steel & Wire Company, Memphis, Tenn.
T. H. Taylor, American Steel & Wire Company, New York City.
W. T. Johnson, the American Axe & Tool Company, Glassport, Pa.
Henry W. Avery, the Avery Stamping Company, Cleveland, Ohio.
H. S. Dormitzer, the American Shear & Knife Company, Hotchkissville, Conn.
Edw. Ingalls, the Atha Tool Company, Newark, N. J.
G. Bommer, Bommer Bros., Brooklyn, N. Y.
Howard R. Bemis, Bemis & Call Hardware & Tool Company, Springfield, Mass.

John C. Beggs, Bemis & Call Hardware & Tool Company, Springfield, Mass.
John L. Blaisdell, Bullard Automatic Wrench Company, Providence, R. I.
Clarence A. Earl, Corbin Screw Corporation, New Britain, Conn.
George E. Chatillon, John Chatillon & Sons, New York City.
Ludlow S. Sherwood, Columbus Hardware Company, Cleveland, Ohio.
W. B. Wood, Columbus Hardware Company, Cleveland, Ohio.
Samuel Disston, Henry Disston & Sons, Incorporated, Philadelphia, Pa.
C. H. Bennett, Daisy Mfg. Company, Plymouth, Mich.
E. C. Hough, Daisy Mfg. Company, Plymouth, Mich.
J. F. Van Lear, E. I. DuPont Company, Wilmington, Del.
F. J. Waddell, E. I. DuPont Company, Wilmington, Del.
Charles W. Asbury, the Enterprise Mfg. Company, Philadelphia.
Jos. W. Gates, the Enterprise Mfg. Company, Philadelphia, Pa.
Lewis W. Klahr, the Enterprise Mfg. Company, Philadelphia, Pa.
Wm. Camier, Harrington & Richardson Arms Company, Worcester, Mass.
Elias G. Heller, Heller Bros. Company, Newark, N. J.
Paul E. Heller, Heller Bros. Company, Newark, N. J.
Geo. Davidson, U. T. Hungerford Brass & Copper Company, New York City.
F. S. Colvin, the Irwin Auger Bit Company, Wilmington, Ohio.
Fred. I. Johnson, Iver Johnson's Arms & Cycle Works, Fitchburg, Mass.
W. A. Shepard, Iver Johnson's Arms & Cycle Works, Fitchburg, Mass.
J. A. Fopeano, Max Klaas, New York City.
George M. Landers, Landers, Frary & Clark, New Britain, Conn.
George B. Nichols, Landers, Frary & Clark, New Britain, Conn.
Charles F. Smith, Landers, Frary & Clark, New Britain, Conn.
James N. Stanley, Landers, Frary & Clark, New Britain, Conn.
Geo. M. North, the Lamson & Sessions Company, Cleveland, Ohio.
Chas. F. Rockwell, Miller Bros. Cutlery Company, Meriden, Conn.
Frank S. Cowles, Norwalk Lock Company, South Norwalk, Conn.
A. M. Kinsley, Oneida Community, Limited, Oneida, N. Y.
S. R. Leonard, Oneida Community, Limited, Oneida, N. Y.
John C. Oliver, Oliver Steel & Iron Company, Pittsburgh, Pa.
W. A. Potter, Potter Mfg. Company, Geneva, Ohio.
J. C. Brammi, H. D. Smith & Co., Plantsville, Conn.
L. H. Schmitt, H. D. Smith & Co., Plantsville, Conn.
W. L. Mayer, Simonds Mfg. Company, Fitchburg, Mass.
J. E. Kelley, Simonds Mfg. Company, Fitchburg, Mass.
G. K. Simonds, Simonds Mfg. Company, Fitchburg, Mass.
A. E. Duncan, Stanley Works, New Britain, Conn.
Geo. P. Hart, Stanley Works, New Britain, Conn.
James Hutchinson, Stanley Works, New Britain, Conn.
Frank M. Tobin, Tobin Arms Mfg. Company, Norwich, Conn.
J. M. Sanders, United States Stamping Company, Moundsville, W. Va.
J. D. Warren, J. D. Warren Mfg. Company, Chicago, Ill.
F. S. Seeley, Wiebusch & Hilger, Limited, New York City.
A. T. Babcock, Yale & Towne Mfg. Company, New York City.
A. W. Clark, Yale & Towne Mfg. Company, New York City.
J. H. Towne, Yale & Towne Mfg. Company, New York City.
G. G. Moore, Nelson Hardware Company, Roanoke, Va.
R. H. Lake, Goyer Company, Greenville, Miss.
J. A. Stewart, Monroe Hardware Company, Monroe, N. C.
Chas. Stollberg, American Car Company, Toledo, Ohio.
C. Worthington, Worthington Hardware Company, Staunton, Va.
C. P. Bowman, C. P. Bowman & Co., Staunton, Va.
Geo. K. Taylor, Lorick & Lowrance, Columbia, S. C.
Leonard Matthews, St. Louis, Mo.
Howard M. Davis, American Sheet & Tin Plate Company, Pittsburgh, Pa.
A. M. Wooster, Savage Arms Company, Utica, N. Y.
J. H. Keating, American Cutlery Company, Chicago, Ill.
John G. Ladrick, Cleveland Twist Drill Company, Cleveland.
S. L. Mitchell, American Sheet & Tin Plate Company, New Orleans, La.
D. W. Fleming, Anniston Cordage Company, Anniston, Ala.
R. J. Johnson, Philadelphia, Pa.
Henry C. Disston, Henry Disston & Sons, Philadelphia, Pa.
Edward Lee, Winchester Repeating Arms Company, Knoxville, Tenn.
J. H. Allen, Howe Scale Company, New York City.
C. L. Miller, American Steel & Wire Company, Pittsburgh, Pa.
Robert W. Ney, American Steel & Wire Company, Cleveland,
H. L. Wilson, American White Lead & Color Works, Detroit, Mich.
G. V. Willson, Hussey, Binns & Co., Pittsburgh, Pa.
A. E. Briggs, Ohio Cultivator Company, Richmond, Va.
S. B. Smith, McKinney Mfg. Company, Charlotte, N. C.
J. M. Wood, American Pulley Company, Philadelphia, Pa.
R. F. Lund, Dover Mfg. Company, Canal Dover, Ohio.
Wm. H. Hayes, Iron City Tool Works, Limited, Pittsburgh, Pa.
H. C. Schaader, Chantrell Tool Company, Reading, Pa.
George J. Metzler, Wm. Stairs, Son & Morrow, Limited, Halifax, N. S.
Chas. E. McFarland, the Wm. Powell Company, Cincinnati, Ohio.
E. G. Jacques, American Steel & Wire Company, New York City.
E. Whitehead, Walden Knife Company, Walden, N. Y.
Dwight Divine, Dwight Divine & Son, Ellenville, N. Y.
C. H. Parsons, P. & F. Corbin, New Britain, Conn.
Charles Glover, Corbin Screw Corporation, New Britain, Conn.
Louis E. Dietz, Boss Washing Machine Company, Cincinnati, Ohio.
W. B. Fox, Jr., W. B. Fox & Bro., New York.
Wm. G. Smythe, American Screw Company, Providence, R. I.
T. E. Oliver, Oliver Bros., New York.
W. M. Cosgrove, Southern Plow Company, Columbus, Ga.
F. S. Dean, Atlanta Agricultural Works, Atlanta, Ga.

READING HARDWARE COMPANY.

THE READING HARDWARE COMPANY, Reading, Pa., journeyed to Hot Springs with a large company made up largely of prominent officials from the works in Reading, together with some managers of branches in New York and elsewhere. They were accompanied by the Philharmonic Band of Reading, numbering 25 men, and occupied two special cars. When Hot Springs was reached the Reading contingent, headed by its band, marched to the Homestead. The Reading people generously placed the Philharmonic Band at the disposal of the Reception Committee. Special talent was provided by the Reading Company in addition to the band for the purpose of giving a musicale, outdoor band concerts, &c. The company also exhibited many specimens of artistic Builders' Hardware and Specialties of their manufacture, and in the form of souvenirs gave the visitors many specimens of their handiwork and manufactures. The company's large contribution to the pleasure of the conventions was formally acknowledged in appropriate resolutions of thanks, and also in many appreciative comments by the members of the associations and their guests.

J. H. WILLIAMS & CO.'S NEW CHICAGO BRANCH.

J. H. WILLIAMS & CO., 150 Hamilton avenue, Brooklyn, N. Y., manufacturers of Drop Forgings, in order to obtain a more prompt distribution of their products and be in closer touch with the Middle West, have just opened a branch store at 18 South Clinton street, Chicago, Ill., in the same building with the Brown & Sharpe Mfg. Company, which is in the heart of the machinery and supply district. At this depot is carried a large stock of Drop Forged Wrenches, Vulcan Chain Pipe Wrenches, Vulcan Chain Pipe Vises, Lathe Dogs, Eye Bolts and all other Drop Forged Specialties in their catalogue, from which to make immediate shipments. There will also be on exhibition there an assortment of specimens of their work in special Drop Forgings to illustrate the variety of work they are doing in this line. Customers and friends are invited to visit this branch, examine the stock and samples of special work, the staff in charge being gratified to impart to buyers any information required regarding this part of the business. Orders and correspondence originating in the Middle West should be forwarded to the above address, where arrangements have been perfected to attend to both promptly.

THE H. MUELLER MFG. COMPANY, Decatur, Ill., manufacturer of water, gas and plumbing goods, sends us clippings from local papers relative to the honors paid on Decoration Day to the memory of the late H. Mueller, founder of the company. The employees to the number of about 300, accompanied by officers of the company, and headed by a band, marched to the cemetery where Mr. Mueller's remains are interred. Ross Venters delivered an appropriate address at the grave, and exquisite floral tributes were deposited upon it. The ceremonies testified most strongly to the high regard in which Mr. Mueller was held by his employees.

CHARLES C. ELY has resigned his offices of secretary and treasurer of the Trimont Mfg. Company, Roxbury, Mass., manufacturer of the Trimo Wrenches, and proposes to take an extended European trip. Eugene L. Button, formerly president of the company, has been elected secretary and treasurer to fill the vacancy caused by the resignation of Mr. Ely, and Alfred G. Ely has been elected president. Mr. Button had held the office of president for the past 12 years. He was formerly prominently identified with the shoe dressing business.

Noair Bottle Stoppers.

The New York Belting & Packing Company, 91-93 Chambers street, New York, has just begun to introduce the Noair stoppers, manufactured by it, here shown. The stoppers, it is said, are made of pure rubber, nonleakable in use and so treated in the process of manufacture as not to affect the most delicate substance or liquid. The rubber is maroon in color, Fig. 1 representing a No. 5 stopper, the plug taper being graduated from 9-16 to ½ inch, the

Fig. 1.—Noair Rubber Bottle Stopper.

Fig. 2.—With Cap Drawn Down.

entire length, including cap, being 1¼ inches. In service the tapered plug is inserted in neck of bottle and the flexible cap, drawn down over the outer edge of neck flange, as in Fig. 2, the effect of which is best seen in Fig. 3. The clinging elasticity of the cap effectually seals a bottle's contents against leakage or evaporation.

Fig. 3.—As in Actual Use.

The value of this property in connection with medicines, acids, alkalies, spirits and various liquids and solids is apparent, as well as the security afforded when carrying bottles in bag or trunk. Especial attention is directed by the company to the suitability of such a stopper for use in hospitals, laboratories, &c., in preventing loss or deterioration. There are six sizes, numbered 1 to 6, inclusive, with plug tapers in the order named of 21-64 to 9-32, 23-64 to 5-16, 7-16 to ⅜, ½ to 7-16, 9-16 to ½ and 11-16 to ⅝ inch, the lengths overall being ⅞, ⅞, 15-16, 1⅛, 1¼ and 1⅜ inches. They are packed in neat boxes of a gross each.

Ideal Shaving and Toilet Mirror.

Lovegrove & Co., Incorporated, 145 North Third street, Philadelphia, Pa., is placing on the market a new adjustable mirror, known as the Ideal shaving and toilet mirror, here shown, for which patents have been applied for. The mirror, which is furnished in 7-inch oval and round shapes, is of heavy beveled French plate glass, the trimmings, back and rods being of nickeled brass. The screw post is gimlet pointed and can readily be screwed into either wood or plaster without the use of any tools. The small rod A, Fig. 2, supplied with the mirror, is placed in the post B and used as a lever in screwing the post into hard woods. The adjustable rod is 6 inches long, and by means of adjusting thumb screws, seen in the cut,

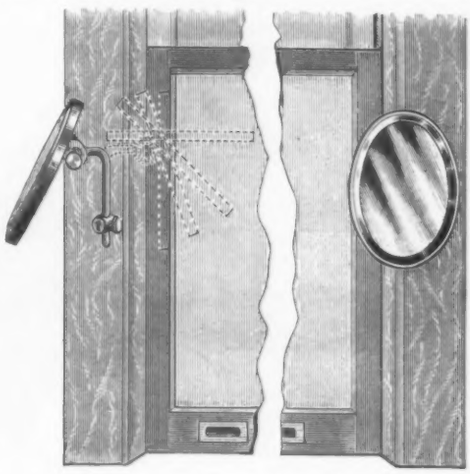


Fig. 1.—Ideal Shaving and Toilet Mirror.

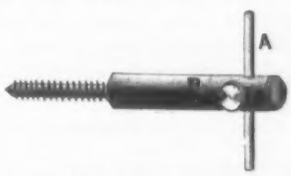
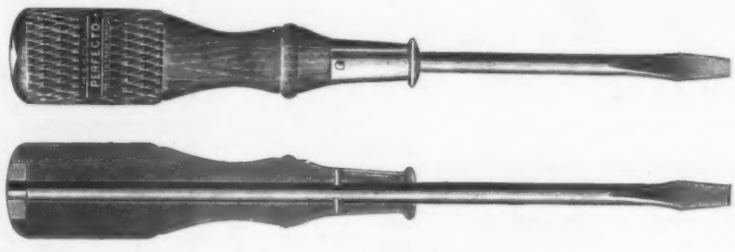


Fig. 2.—Gimlet Pointed Screw Post.

enables the mirror to be placed and retained in any desired position. These mirrors are neat and attractive in appearance and are carefully packed for delivery in suitable boxes.

Perfecto Screw Driver.

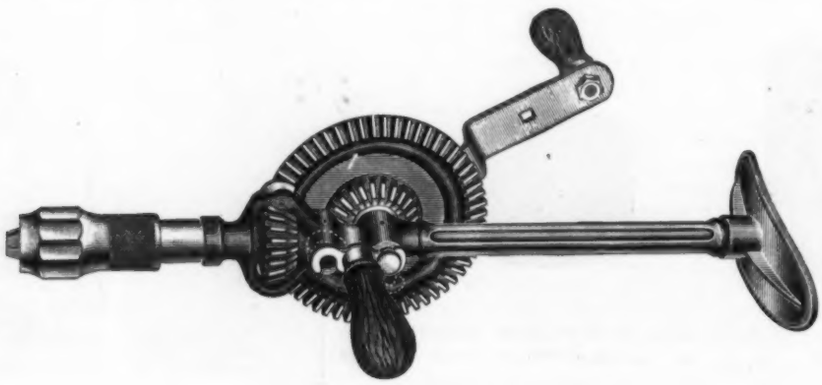
The screw driver shown herewith is being placed on the market by the Bridgeport Hardware Mfg. Company, Bridgeport, Conn. It is made from the best quality of special screw driver steel, and the blade is forged down, tempered and tested, each blade being highly polished and nickel plated. The blade extends through the entire length of the handle, having a square end which is set securely into a square hole in the square steel nut, which in turn is countersunk into a square hole in the butt end of the handle. There is a heavy steel pin riveted through the ferrule, handle and blade, to prevent turning or loosening of the blade in the handle. The construction of the tool is workmanlike and admits of hammering on the butt end or using the screw driver as a chisel without injury to the tool. It is made in sizes from 2 to 12 inches, inclusive.



Perfecto Screw Driver.

Geared Breast Drill.

John S. Fray & Co., Bridgeport, Conn., are just introducing the geared breast drill, No. 9, here illustrated. The frame is of malleable iron, strong and light. The principal features of this drill are Barber style chuck, with steel alligator jaws for holding both round and square shank tools, ball bearing thrust, cut gears and black walnut handles. To operate the latch which holds the large gear spindle in place in changing speed, as also the latch which holds the chuck from turning in changing drills, it is not necessary to remove the hand from the supporting handle, as both latches are readily controlled by the thumb and forefinger, the hand still retaining its hold on the handle. Each operation can be made almost instantaneously. The gear spindle latch is held in place by an automatic stop on the inside of the latch, which, while offering little resistance in shifting, is sufficient to hold when in place. The chuck, crank, steel pinions and shifting latch are polished, and frame, breast plate and large wheel japanned.



Geared Breast Drill No. 9.

Automatic Numbering Machine With Indicator.

The Bates Machine Company, 346 Broadway, New York, has just put on the market model No. 50 numbering machine with indicator, as illustrated herewith.

Automatic Numbering Machine, with Indicator, Model 50.

Many of the office and factory systems now used require a numbering machine that will expeditiously number consecutively or in duplicate, as well as to repeat any number a given number of times, and yet be so easily manipulated as to make the operation easy and practicable. This numbering machine has been produced to meet those conditions, and all parts are interchangeable. It is only necessary to move the indicator until the word representing the class of numbering desired appears in the window of the front plate. When set "consecutive" the number advances "1" to "999,999," changing all the wheels automatically. When set "duplicate" each number is printed twice and is then advanced consecutively. When set "repeat" the automatic mechanism is detached and the number is repeated continuously. Only the standard size and style of figures, shown under the illustration, are furnished in the stock machines. These are deeply cut, finely engraved and well proportioned. Being well spaced they are legible, and will be found large enough for practically all purposes, while condensed to occupy but a small space. Other styles and sizes will be made to order at an extra charge. The wheels and ratchets are divided into equal tenths, thus assuring accuracy of movement. "Drop ciphers," with their springs and pins, have been eliminated, and the wheels themselves are made depressible to provide the necessary spaces preceding the unit wheel. The plunger, which is made of Bessemer steel, is shielded from view when in its normal position, and never presents the unsightly appearance of the oiled brass plunger with the nickel partly peeled off, nor can the hands be soiled by contact with it. All machines of this model are made with six wheels, with a numerical capacity of from "1" to "999,999," and may be reset to commence at any desired number. The frame is very substantial, being made of drawn steel, ¼ inch thick, and is handsomely finished and blued. The machine weighs only 14 ounces. The figures are automatically inked before each impression from a thick felt pad. The pad holder may be instantly removed from the machine for reinking. An accurate gauge plate assures printing precisely upon the line. For the foreign trade the company has two branch houses in England—viz., 63 and 64 Chancery lane, London, W. C., and 2 Cooper street, Manchester, where orders and correspondence may be sent.

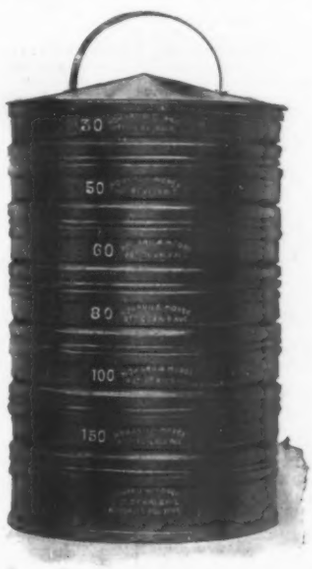
Anti-Rusting Dinner Pail.

The anti-rusting coated oval dinner pail shown herewith is put on the market by the Lisk Mfg. Company, Canandaigua, N. Y. The pail has stamped seamless cup, cover and trays and is heavily retinned. It is made in 3, 4, 5 and 6 quart sizes.

Anti-Rusting Dinner Pail.

Laboratory Testing Sieves.

Howard & Morse, 45 Fulton street, New York, manufacturers of wire cloth in various metals, together with innumerable finished products embodying this material, are making a specialty of testing sieves for cement, sand, drugs, ores, pigments, water, &c. These goods are made exclusively to order on specifications as to size of mesh, dimensions of sieves and finish. The sieves are usually made with wood, tin, brass or aluminum hoops, and can be made single, in nests or tiers, open or with covers and receivers at bottom, in diameters of 3 to 20 inches, inclusive, each, any depth required. A very practicable and convenient form, resembling somewhat in outer appearance a workman's dinner pail, is shown in the illustration herewith. This style, it will be observed, has a cover, a customary size being approximately 5½ to 7 inches diameter, with sieves each 1 inch deep. A receiver is fitted at the bottom. One frequently made has a top



Laboratory Testing Sieves in Graded Form.

sieve of 30 mesh, followed consecutively by meshes of 50, 60, 80, 100 and 150, each sieve being rabbeted on the bottom to fit snugly on the one immediately below, so that there is no open space for the escape of material during the process of agitation in differentiating the mass. In use engineers, analysts and others, by placing a given quantity of material in the top receptacle and shaking thoroughly, by hand or machine, are enabled to scientifically determine the relative proportions as to size of the numerous commodities for which the article is designed.

Moritz Snap Hook.

The James Reilly Repair & Supply Company, 229-230 West street, New York, is offering the snap hook shown

Moritz Snap Hook.

herewith. The hook is a drop forging, uniform in quality of material, and has a lip which serves as a catch and enables the hook to be brought into easy engagement with a ring, link or bracket handle. The latch is arranged so it will not need to be opened by hand. The arrangement and location of the latch spring are such as to amply protect it from injury or accidental displacement, and the shape of the spring allows freedom of play and avoids overstraining and liability of fracture of the spring when the latch is opened wide. The swing of the latch will allow the entrance of a rope or ring of considerable size. The use of the hook, it is explained, will avoid the necessity of "mousing" with marline or wire as is often practiced. Among the uses to which the hook is adapted are boat davits, ash hoists, ammunition hoists, cargo slings and all freight handling and derricks in marine or naval work. It is also adapted to all building trades, hoisting and excavating, mining, lumbering and agricultural work, &c. The smaller sizes are used for hitching posts, harness hooks, well buckets, &c. The hooks are made in four sizes, for loads from 300 to 1200 pounds.

PAINTS, OILS AND COLORS

White Lead, Zinc, &c.—

	℔ lb
Lead, English white, in Oil..	9¼@ 9¼
Lead, American white., in Oil:	
Lots of 500 lb or over..	@ 6½
Lots less than 500 lb..	@ 7
In Barrels..	@ 6
Lead, White, in oil, 25 lb tin pails, add to keg price..	@ ½
Lead, White, in oil, 12½ lb tin pails, add to keg price..	@ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price ..	@ 1½
Lead, American. Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.	
	℔ lb
Lead, White, Dry in bbls..	@ 6
Zinc, American, dry..	4¾@ 4¾
Zinc, French:	
Paris, Red Seal, dry..	8¼
Paris, Green Seal, dry..	9¼
Antwerp, Red Seal, dry..	7¾
Antwerp, Green Seal, dry..	8¾
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over..	11⅝@12⅛
Lots of less than 1 ton..	11¾@12⅜
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over..	10⅝@10⅞
Lots of less than 1 ton..	10⅝@11¼

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	℔ lb
Black, Carbon..	5 @10
Black, Drop, Amer..	4 @ 6
Black, Drop, Eng..	5 @15
Black, Ivory..	16 @20
Lamp, Com..	4½@ 6
Blue, Celestial..	4 @ 6
Blue, Chinese..	29 @32
Blue, Prussian..	27 @30
Blue, Ultramarine..	4½@15
Brown, Spanish..	½@ 1
Carmine, No. 40..	$3.50@3.00
Green, Chrome, ordinary..	3½@ 6
Green, Chrome, pure..	17 @25
Lead, Red, bbls., ⅞ bbls. and kegs:	
Lots 500 lb or over..	@ 6½
Lots less than 500 lb..	@ 7
Litharge, American, bbls..	6 @ 6½
Ocher, American..	℔ ton $8.50@16.00
Orcher, American Golden..	2½@ 3½
Orcher, French..	1½@ 2½
Orcher, Foreign Golden..	3 @ 4
Orange Mineral, English..	8 @10
Orange Mineral, French..	10½@11¼
Orange Mineral, German..	7¾@10
Orange Mineral, American..	8 @ 8¼
Red, Indian, English..	4½@ 8½
Red, Indian, American..	3 @ 3½
Red, Turkey, English..	4 @10
Red, Tuscan, English..	7 @10
Red, Venetian, Amer..	℔ 100 lb $0.50@1.25
Red Venetian, English..	100 lb $1.15@1.75
Sienna, Italian, Burnt and Powdered..	3 @ 9½
Sienna, Ital., Raw, Powd..	3 @ 6½
Sienna, American, Raw..	1½@ 2
Sienna, American, Burnt and Powdered..	1¼@ 2
Talc, French..	℔ ton $20.00@30.00
Talc, American..	℔ ton 16.00@25.00
Terra Alba, French..	℔ 100 lb 90 @1.00
Terra Alba, English..	℔ 100 lb 90 @1.00
Terra Alba, American, ℔ 100 lb., No. 1..	.60 @70
Terra Alba, American, ℔ 100 lb., No. 2..	.45 @50
Umber, T'key, Bnt. & Pow..	2½@ 3½
Umber, Turkey, Raw & Pow..	2½@ 3½
Umber, Burnt, Amer..	1½@ 2
Umber, Raw, Amer..	1½@ 2
Yellow, Chrome..	11 @14
Vermilion, American Lead..	19 @25
Vermilion, Quicksilver, bulk..	@65
Vermilion, Quicksilver, bags..	@66
Vermilion, English, Import..	75 @80
Vermilion, Chinese..	$0.90@1.00

Colors in Oil—

	℔ lb
Black, Lampblack..	12 @14
Blue, Chinese..	36 @46
Blue, Prussian..	32 @36
Blue, Ultramarine..	13 @16
Brown, Vandyke..	11 @14
Green, Chrome..	10 @15
Green, Paris..	@24
Sienna, Raw..	12 @15
Sienna, Burnt..	12 @15
Umber, Raw..	11 @14
Umber, Burnt..	11 @14

Miscellaneous—

Barytes, White, Foreign..	℔ ton $17.50@19.00
Barytes, Amer. floated..	℔ ton 17.00@19.00
Barytes, Crude, No. 1..	℔ ton 10.00@11.00
Chalk, in bulk..	℔ ton 3.00@ 3.25
Chalk, in bbls..	℔ 100 lb .. @ .35
China Clay, English..	℔ ton 11.00@17 00
Cobalt, Oxide..	℔ 100 lb 2.50@ 2.60
Whiting, Common..	℔ 100 lb .43@ .48
Whiting, Gilders..	℔ 100 lb .50@ .56
Whiting, Ex. Gilders..	℔ 100 lb .55@ .60

Putty, Commercial—℔ 100 lb

In bladders..	$1.70@..
In bbls. or tubes..	1.05@1.10
In 1 lb to 5 lb cans..	2.00@2.90
In 12½ to 50 lb cans..	1.40@1.55

Spirits Turpentine—℔ gal.

In Oil bbls..	79½@80
In machine bbls..	80 @80½

Glue—

	℔ lb
Cabinet..	11 @15
Common Bone..	7 @ 9
Extra White..	18 @24
Foot Stock, White..	11 @14
Foot Stock, Brown..	8 @11
German Hide..	12 @18
French..	10 @40
Irish..	13 @16
Low Grade..	9 @12
Medium White..	14 @17

Gum Shellac—

	℔ lb
Bleached Commercial..	28 @30
Bone Dried..	39 @40
Button..	36 @45
Diamond I..	50 @52
Fine Orange..	40 @45
A. C. Garnet..	32 @34
D. C..	65 @..
Octagon B..	45 @..
T. N..	29 @30
V. S. O..	45 @..

Animal, Fish and Vegetable Oils—℔ gal.

Linseed, City, raw..	50 @51
Linseed, City, boiled..	52 @53
Linseed, State and West'n, raw..	48 @49
Linseed, raw Calcutta seed..	@60
Lard, Prime, Winter..	57 @59
Lard, Extra No. 1..	47 @48
Lard, No. 1..	35 @39
Cotton-seed, Crude, f.o.b. mills..	22½@23
Cotton-seed, Summer Yellow, Prime..	29 @29½
Cotton-seed, Summer Yellow, off grades..	@..
Sperm, Crude..	55 @..
Sperm, Natural Spring..	@..
Sperm, Bleached Spring..	@..
Sperm, Natural Winter..	60 @63
Sperm, Bleached Winter..	63 @65
Tallow, Prime..	51 @53
Whale, Crude..	@..
Whale, Natural Winter..	42 @44
Whale, Bleached Winter..	44 @46
Menhaden, Brown, Strained..	28 @29
Menhaden, Light, Strained..	29 @30
Menhaden, Bleached, Winter..	31 @32
Menhaden, Ex-Bld. Winter..	32 @33
Menhaden, Southern..	17 @18
Cocoanut, Ceylon..	℔ lb 6½@ 6⅝
Cocoanut, Cochin..	℔ lb 7 @ 7½
Cod, Domestic, Prime..	34 @36
Cod, Newfoundland..	39 @41
Red Elaine..	31 @32
Red, Saponified..	℔ lb 4½@ 4¾
Olive, Italian, bbls..	54 @58
Neatsfoot, prime..	49 @50
Palm, Logos..	℔ lb 5⅜@ 5½

Mineral Oils—

Black, 29 gravity, 25@30 cold test..	℔ gal. 10½@11½
Black, 29 gravity, 15 cold test..	11½@12½
Black, Sumatra..	10½@11½
Cylinder, light filtered..	18 @19
Cylinder, dark filtered..	16 @17
Paraffine, 903-907 gravity..	12¾@13
Paraffine, 903 gravity..	11½@12
Paraffine, 883 gravity..	9½@ 9½
Paraffine, Red..	11½@13

In small lots ½¢ advance.

REVISED JUNE 13, 1905

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1904, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—
Domestic, ℔ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—
Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—
See *Caps, Cartridges, Shells, &c.*

Anvils—American—
Eagle Anvils.....℔ lb 7¼@7¾¢
Hay-Budden, Wrought.....9@9¼¢
Horseshoe brand, Wrought.....9@9¼¢
Trenton .....℔ lb 9@9¼¢

Imported—
Peter Wright & Sons.....℔ lb 10¼¢

Anvil, Vise and Drill—
Millers Falls Co., $18.00.....15&10%

Apple Parers—
See *Parers, Apple, &c.*

Aprons, Blacksmiths'—
Livingston Nail Co.....33⅓%

Augers and Bits—
Com. Double Spur.....70&10%
Boring Mach. Augers.....70&10%
Car Bits, 12-in. twist.....50&10%
Jennings' Patn. reg. finish.50&10%
Ford's Auger and Car Bits.....40&5
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list..25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Millers Falls.....50&10&7½%
Ohio Tool Co.'s Bailey Auger and Car Bits.....40&10%
Pugh's Black.....30%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60&10%
Wright's Jennings' Bits.....50%

Bit Stock Drills—
See *Drills, Twist.*

Expansive Bits—
Clark's small, $18; large, $26....50&10%
Clark's Pattern, No. 1, ℔ doz. $36; No. 2, $18.....50&10@60%
Ford's, Clark's Pattern.....50&10@60%
C. E. Jennings & Co., Steer's Pat..25%
Swan's 60%

Gimlet Bits—
Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.60; 11 to 13, $5.75

Hollow Augers—
Bonney Pat., per doz. $9.00@10.00
Ames .....25&10%
New Patent.....25&10%
Universal 20%
Wood's Universal.....25%

Ship Augers and Bits—
Ford's .....33⅓@5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....35&5%
Ohio Tool Co.'s.....40%
Snell's 40%

Awl Hafts—
See *Hafts, Awl.*

Awls—
Lead Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Rocket..gro.$11.50@12.00
Hurwood 40%

Awl and Tool Sets—
See *Sets, Awl and Tool.*

Axes—
Single Bit, base weights. (up to 3½ lb.)
First Quality.....$6.50
Second Quality.....$6.00
NOTE.—Heavier Weights add Extras as per regular schedule.

Axle Grease—
See *Grease, Axle*

Axles—
Iron or Steel
Concord, Loose Collar...4¼@4¾¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose...3¼@3¾¢
No. 1½ Com., New Style3¾@4¼¢
No. 2 Solid Collar.....4@4½¢
Nos. 7, 8, 11 and 12....75@75&5%
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18.....75&10@75&10&5%
Nos. 19 to 22.....75&10@75&10&5%

Boxes, Axle—
Common and Concord, not turned lb..4½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent.....lb. 8½@9¢

Bait—
Fishing—
Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—
Sash—
Caldwell new list.....50%
Pullman .....50&10@60%

Spring—
Spring Balances.....60@60&5%
Chatillon's:
Light Spg. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30%

Barb Wire—
See *Wire, Barb.*

Bars—
Crow—
Steel Crowbars, 10 to 40 lb.... per lb., 2¾@3¼¢

Towel
No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—
Scale Beams.....40&10@50%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—
Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ℔ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized..℔ doz. $1.75
Western W. G. Co.:
No. 1 Electric.....℔ gro. $7.80
No. 2 Buffalo.....℔ gro. $9.00
No. 3 Perfection Dust.....℔ gro. $8.00

Egg—
Holt-Lyon Co.:
Holt, No. A, Japanned....℔ doz. $1.20
Holt, No. 1, Tinned.....℔ doz. $1.50
Holt, No. B, Japanned....℔ doz. $2.00
Holt, No. 2, Tinned.....℔ doz. $2.25
Lyon, No. 2, Japanned....℔ doz. $1.25
Lyon, No. 3, Japanned....℔ doz. $1.50
Taplin Mfg. Co.:
No. 60 Improved Dover.....℔ gro. $6.00
No. 75 Improved Dover.....$6.50
No. 100 Improved Dover.....$7.00
No. 102 Improved Dover, Tin'd..$8.50
No. 150 Improved Dover, Hotel..$15.00
No. 152 Imp'd Dover, Hotel, T'd..$17.00
No. 200 Imp'd Dover Tumbler....$8.50
No. 202 Imp'd Dover Tumbler, T'd.$9.50
No. 300 Imp'd Dover Mammoth, ℔ doz. $25.00
Western, W. G. Co., Buffalo.....$7.00
Wonder (S. S. & Co.).℔ gro. net, $6.00

Bellows—
Blacksmith, Standard List.. 60&10@70&10%

Blacksmiths'—
Inch..	30	32	34	36	38	40
Each.	$3.25	3.50	4.00	4.50	5.00	5.75
Extra Length: Each.	$3.75	4.25	4.75	5.25	6.00	7.00

Hand—
Inch...	6	7	8	9	10
Doz..	$4.50	5.00	5.50	6.00	6.50

Molders—
Inch.	9	10	11	12	14
Doz.	$8.00	9.00	10.50	12.50	14.50

Net Prices.

Bells—
Cow—
Ordinary goods...75&5@75&10&5%
High grade.....70&10@70&10&5%
Jersey .....75&10%
Texas Star.....50%

Door—
Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's....60&10&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—
Hand Bells, Polished, Brass.. 60&5@60&10&5%
White Metal.....60%
Nickel Plated....50&10@50&10&5%
Swiss .....60@60&7½%
Cone's Globe Hand Bells.....33⅓@35%
Silver Chime.....33⅓@35%

Miscellaneous—
Farm Bells.....lb. 2¼¢
Steel Alloy Church and School 50&10&5@60&5%
American Tube & Stamping Co. Gongs 75%
Table Call Bells.....50@50&10%

Belting—
Leather—
Extra Hvy, Short Lap..60@60&5%
Regular Short Lap...65&10@70%
Standard .....70&5@70&10%
Light Standard.....70&10@75%
Cut Leather Lacing.....60&10%
Leather Lacing Sides, per sq. ft. 17½@18¢

Rubber—
Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard .....65&70%
Extra .....60&5@60&10%
High Grade.....50&5@50&10%

Bench Stops—
See *Stops, Bench*

Benders and Upsetters, Tire—
Detroit Perfected Tire Bender.....40%
Green River Tire Benders and Upsetters 20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.

Bicycle Goods—
John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—
Tackle—
Common Wooden....70&10@75&5%
Hartz St. Tackle Blocks.....50@50&5%
Hollow Steel Blocks, with Ford's Patent Sheaves.....50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty Mal. Iron....50&10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—
Zinc, Crystal, &c...30&10@40&10%

Boards, Wash—
See *Washboards.*

Bobs, Plumb—
Keuffel & Esser Co.....33⅓%

Bolts—
Carriage, Machine, &c.—
Common Carriage (cut thread): ⅜ x 6 and Smaller.....75&10%
Larger and longer.....70&7½%
Phila. Eagle $3.00 list May 24,'99 80%
Bolt Ends, list Feb. 14,'95..70&2½%
Machine, ⅜ x 4 and smaller 75&2½%
Machine, larger and longer.. 70&5%

Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knob:
Inch.....	3	4	5	6	8
Per doz.	$0.30	.35	.45	.56	.75

Cast Iron Spring Foot, Jap'd:
Inch.....	6	8	10
Per doz.....	$1.15	1.40	2.00

Cast Iron Chain, Flat, Japanned:
Inch.....	6	8	10
Per doz.....	$0.95	1.25	1.55

Cast Iron Shutter, Japanned, Brass Knobs:
Inch.....	6	8	10
Per doz.....	$0.80	.90	1.20

Wrt Barrel Japd.....80@80&10%
Wrt " Bronzed....50@50&10%
Wrt. Spring...70&10@70&10&10%
Wrt. Shutter.....50&5@50&10&5%
Wrt. Square Neck.....75@75&10%
Wrt Square 66⅔&10@66⅔&10&10%
Ives' Patent Door.....60%

Stove and Plow—
Plow .....65&10@65&10&10%
Stove .....82½&10@82½&10&5%

Tire—
Common 80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Tap—
Borers Tap, Ring, with Handle:
Inch.....	1¼	1½	1¾	2
Per doz...	$4.80	5.60	6.40	8.00
Inch	2¼	2½		
Per doz	$6.65	11.50		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.....25%

Boxes, Mitre—
C. E. Jennings & Co.....30%
Langdon .....15&10%
Perfection .....℔ doz. $30.00
Schatz 40%
Stanley R. & L. Co.:
Nos. 240 to 460.....30%
Nos. 50 and 60.....35%

Braces—
Common Ball, American..$1.25@1.30
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60&10@65%
Stanley R. & L. Co.:
Stanley 35%
Victor 45%

Brackets—
Wrought Steel...80&10@80&10&5%
Bradley's Wire Shelf:
Full cases.....80&10&10%
Broken cases.....80&10%
Griffin's Pressed Steel.....80@80&10%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf.....75%
Stowell's Sink.....50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods—
See *Wire and Wire Goods.*

Broilers—
Kilbourne Mfg. Co.....75&20%
Western, W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—
Price per dozen.
Quart.....	10	12	14
Water, Regular...	1.45	1.70	1.90
Water, Heavy....	3.40	3.70	3.80
Fire, Rd. Bottom..	2.30	2.55	2.95
Well	2.55	2.87	3.15

Bucks, Saw—
Hoosier.....℔ gro. $36.00

Bull Rings—
See *Rings, Bull*

Butts—
Brass—
Wrought, list Sept., '96.....30%
Cast Brass, Tiebout's.....50%

Cast Iron—
Fast Joint, Broad.....40&10@50%
Fast Joint, Narrow....40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....75@70@65
Parliament Butts.....70@70@65

Wrought Steel—
Table and Back Flaps...75%
Narrow and Broad.....75%
Inside Blind.....75%
Loose Pin.....75%
Loose Pin, Jap'd.....70&10%
Loose Pin, Ball and Steeple Tip 85%
Japanned Ball Tip Butts... 70&10%
Bronzed, Wrt., Nar. and Inside Blind Butts....65&10%

Fr. 10&10@10&10&5%

Cages, Bird—
Hendryx Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓%
200, 300, 600 and 900 series.....40&10%

Hendryx Bronze:
700, 800 series....40&10%
Hendryx Enameled....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb.4¢&1¼¢
Sharp, 1 prong...per lb., 4½@4¾¢
Gautier, Blunt.....4@4¼¢
Gautier, Sharp.....4½@4¾¢
Perkins', Blunt Toe.....₰ lb 3.65¢
Perkins', Sharp Toe.....₰ lb 4.15¢

Can Openers—

See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern.....	$1.35	1.85	2.05 each.
New York Pattern..	1.50	2.20	2.45 each.
Baltimore Pattern..	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$18.00	60.00	129.60 gro., net.

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....per M 34@35¢
F. L.....per M 40@42¢
G. E.....per M 48@50¢
Musket .....per M 62@63¢

Primers—

Berdan Primers, $2 per M...20%
B. L. Caps (Sturtevant Shells) $2 per M.....20%
All other primers per M.$1.52@1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd .$1.90
B. B. Caps, Round Ball....$1.40
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed .....70@70&10%
Plate .....60&10@60&10&5%
Philadelphia .....75@75&10%
Acme, Ball Bearing.....33⅓%
Boss .....70&10%
Boss Anti-Friction.....70&10%
Gem (Roller Bearing).....80
Martin's Patent (Phoenix).....45%
Standard Ball Bearing.....45%
Tucker's Patent low list.....50%
Yale (Double Wheel) low list.....50%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	7-16	½	9-16
$7.50	5.35	4.40	3.70	3.55	3.45	3.40
⅝	¾	⅞	1 to 1¼ inch.			
$3.35	3.30	3.25	3.25 per 100 lb.			

German Coil.....60&10&10@70%

Halters and Ties—

Halter Chains...60&10@60&10&10%
German Pattern Halter Chains, list July 24, '97.....60&10&10%
Cow Ties.....60@60&10%

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Str'ght, with ring .$23.50
6½—6-2, Str'ght, with ring .$24.50
6½—8-2, Str'ght, with ring .$28.00
6½—10-2, Str'ght, with ring.$32.00
NOTE.—Add 2c per pair for Hooks. Twist Traces 2c per pair higher than Straight Link.
Trace, Wagon and Fancy Chains .....60&5@60&10&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron .....60&10@60&10&5%
Brass .....60&10@60&10&10%
Safety Chain.....75@75&10&5%
Gal. Pump Chain.....lb. 5@5¼%
Covert Mfg. Co.:
Breast .....35&5%
Halter .....35&5%
Heel .....35&5%
Rein .....35&5%
Stallion .....35&5%
Covert Sad. Works:
Breast 70%
Halter 70%
Hold Back.....70%
Rein 70%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Eureka Coil and Halter....45@50&5%
Niagara Coil and Halter....45@50&5%
Niagara Cow Ties.....45&5@50&10&5%
Niagara Wire Dog Chains..45@50&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl.-Jointed Chain.....50%

Chalk—(From Jobbers.)

Carpenters' Blue....gro. 35@38¢
Carpenters' Red....gro. 30@33¢
Carpenters' White....gro. 25@28¢
See also Crayons.

Checks, Door—

Bardsley's 45%
Columbia .....50&10%
Eclipse .....60&10%

Chests, Tool—

American Tool Chest Co.:
Boy's Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters', etc., Chests, with Tools.....20%
Machinists' and Pipe Fitters' Chests, Empty.....50%
Tool Cabinets.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

Chisels—Socket Framing and Firmer

Standard List.....75@75&10%
Buck Bros.....30
Charles Buck.....30
C. E. Jennings & Co. Socket Firmer No. 10.....60%
C. E. Jennings & Co. Socket Framing No. 15.....60%
Ohio Tool Co.'s.....70
Swan's 70
L. & I. J. White.....30@30&5%

Tanged—

Tanged Firmers.33 1-3@33 1-3&10%
Buck Bros.....30
Charles Buck.....30
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White, Tanged.....25&5%

Cold—lb.

Cold Chisels, good quality .13@15¢
Cold Chisels, fair quality .11@12¢
Cold Chisels, ordinary... 9@10¢

Chucks—

Beach Pat., each $8.00.....35&5%
Empire 25
Blacksmiths' 25
Jacobs' Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Patent Chucks:
Independent Lathe Chucks.....50%
Universal 50%
Combination 50%
Drill Chucks, New Model.....30%
Drill Chucks, Standard.....45%
Drill Chuck, Skinner Pat., 0, 1, 2..35%
Drill Chucks, Skinner Pat., 3, 4, 5, 6, 7, 8.....35%
Drill Chucks, Positive Drive.....30%
Planer Chucks.....25%
Face Plate Jaws.....40%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination 50%
Czar Drill.....35%
Combination Geared Scroll.....40%
Geared Scroll.....40%
Independent 50%
Independent Steel.....40%
Union Drill.....45%
Universal 50%
Independent Iron F. Plate Jaws.40%
Independent Steel F. Plate Jaws.40%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—

Adjustable, Hammers'.....20@20&5%
Cabinet, Sargent's.....50&10%
Carriage Makers', P. S. & W. Co..50%
Carriage Makers', Sargent's.....40%
Besly, Parallel.....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co.....40%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....45%

Sidewalk—

Star Socket, All Steel..₰ doz. $4.05 net
Star Shank, All Steel..₰ doz. $3.24 net
W. & C. Shank, All Steel, ₰ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
New Haven Edge Tool Co.'s.....45%
Fayette R. Plumb.....33⅓@33⅓&10%
L. & I. J. White.....30%

Clippers—

Chicago Flexible Shaft Company:
'98 Chicago Horse.....$8.75 } 15%
1902 Chicago Horse.....10.75 }
20th Century Horse, each, $5.00....20%
Lightning Belt.....$15.00 }
Chicago Belt.....$20.00 } 15%
Stewart's Patent Sheep, $12.75....20%

Finger Nail Clippers—

Smith & Hemenway Co.₰ doz. net $2.00

Clips, Axle—

Eagle, 5-16 and ⅜ in..75@75&10%
Norway, 5-16 and ⅜ in.60&10@70%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—

Hardware list: Compression, Plain Bibbs, Globe, Kerosene, Racking, &c., Cocks.....70&10@75%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list 40%

Combs, Curry—

Metal Stamping Co.....40%

Mane and Tail—

Covert's Saddlery Works.....60&10%

Compasses, Dividers, &c.

Ordinary Goods.....75&5@75&10%
Bemis & Call Hdw. & Tool Co.:
Dividers 65%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses 50%

Conductor Pipe,—

L. C. L. to Dealers: Galvanized.

Territory.	*Nested.*	*Not nested.*
Eastern	....70&15%	70&10%
Central	....70&7½%	70&2½%
Southern	...70&2½%	60&20%
So. Western	..60&20%	60&10%

Copper.

Eastern	.....50&5%
Central	.....50&2½%
Southern	.....50%
So. Western	.....40&10&5%

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal, each..	2	3	4	6	8
Labrador ...	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.....	3	4		6	8
Iceland, ea..	$1.80	$2.10	$2.40		$3.00
Gal.....	2	3	4	6	8
Galv. Lined, ea.	$1.85	$2.00	$2.25	$2.90	$3.90

25%

Gavl. Lined, side handles.

Gal.	2	3	4	6	8
Each.	$1.95	$2.15	$2.40	$3.30	$4.15..25%

Coopers' Tools—

See *Tools, Coopers'.*

Cord—Sash—

Braided, Drab.....lb. 35¢
Braided White, Com.lb.,21@22½¢
Cable Laid Italian..... lb., A, 18¢; B, 16¢
Common India.....lb. 10@10½¢
Cotton Sash Cord, Tw'ted..11@17¢
Patent Russia.....lb...@14¢
Cable Laid Russia....lb...@15¢
India Hemp, Braided..lb...@18¢
India Hemp, Twisted..lb. 12@13¢
Patent India, Twisted.lb. 12@13¢
Anniston Cordage Co.: Braided Cotton, Old Glory, Nos. 7 to 12.....₰ lb 28 ¢
Anniston, Nos. 7 to 12.....₰ lb 22 ¢
Old Colony, Nos. 7 to 12..₰ lb 22 ¢
Anniston Drab, Nos. 7 to 12..₰ lb 26 ¢
Pearl Braided, cotton, No. 6, ₰ lb, 22½¢; No. 7, 21½¢; Nos. 8 to 12, 21¢
Eddystone Braided, Nos. 7, 8, 9 and 10.....₰ lb 24 ¢
Eddystone Braided Cotton, No. 6..₰ lb 25 ¢
Harmony Cable Laid Italian, Nos. 7 to 10.....₰ lb 23 ¢
Peerless:
Cable Laid Italian.....16 ¢
Cable Laid Russian.....14 ¢
Cable Laid India.....12 ¢
Braided India.....18 ¢
Samson, Nos. 8 to 12:
Braided, Drab Cotton.....₰ lb 40 ¢
Braided, Italian Hamp....₰ lb 40 ¢
Braided, Linen.....₰ lb 55 ¢
Braided, White Cotton or Spot.....₰ lb 35 ¢
Massachusetts, White.....₰ lb 28 ¢
Massachusetts, Drab.....₰ lb 32 ¢
Phoenix, White, Nos. 8 to 12, 24¢; No. 7, 24½¢; No. 6, 25½¢.
Silver Lake:
A quality, Drab.....40 ¢
A quality, White.....35 ¢
B quality, Drab.....35 ¢
B quality, White.....30 ¢
Italian Hemp.....40 ¢
Linen .....57½¢

Wire, Picture—

List Oct., '00.....
85&10&10@85&10&10&5%
Hendryx Standard Wire Picture Cord, 85&10&5%

Cradles—

Grain .....40&12½%

Crayons—

White Round Crayons, gr. 5½@6¢
Cases, 100 gro., $5.00, at factory.
D. M. Steward Mfg. Co.: (Case lots, 20%)
Jumbo Crayons.....gr. $3.50
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square.....gr. $1.50
Rolling Mill Crayons.....gr. $2.50
Railroad Crayons (composition) gr. $2.00
Zelnicker's Lumber:
Red, Blue, Green.....₰ gro. $6.50
Black .....₰ gro. $4.00
See also Chalk.

Crooks, Shepherds'

Fort Madison, Heavy.....₰ doz. $7.00
Fort Madison, Light.....₰ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847.₰ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor .....₰ doz. $3.00
Wm. Rogers & Son.....₰ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward 40%

Meat and Food—

American 30%

Nos.	1	2	3	4	8
Each.....	$5	$7	$10	$25	$60

Enterprise .....25@25&7½%

Nos.	5	10	12	22	32
Each.....	$2	$3	$2.75	$4.50	$6

Dixon's .....₰ doz. 30&10@40%

Nos.....	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal .....40&10@50%
Little Giant.....₰ doz. 33⅓@40%

Nos....	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers.....40%
New Triumph No. 605, ₰ doz. $24.00..
.....30&10@40%
Russwin Food, No. 1, $24.00; No. 2, $27.00 .....45&10&10%
Woodruff's .....₰ doz. 30&10@40%

Nos.....	100	150
	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters, 24 x 7, 26 x 8, 30 x 9.....55%
Kraut Cutters, 36 x 12, 40 x 12....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....₰ doz. $3.00
Combined Slaw Cutter and Corn Grater .....₰ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife..₰ gr. $18@$20
Slaw Cutters, 2 Knife..₰ gr. $22@$36

Tobacco—

All Iron, Cheap..doz. $1.25@$4.50
Enterprise .....25@30%
National, ₰ doz., No. 1, $21; No. 2, $18 .....40%
Sargent's, ₰ doz., No. 2.....60%
Sargent's, Nos. 12 and 21.....60&10%

Washer—

Appleton's, ₰ doz., $16.00....50&10&10%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger..per doz., $9.00
Iwan's Imp'ved Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers .....₰ doz. $6.25
Iwan's Perfection Post Hole Digger.. ₰ doz. $8.25
Iwan's Split Handle Post Hole Diggers .....₰ doz. $7.25
Kohler's Universal.....₰ doz. $15.00
Kohler's Little Giant.....₰ doz. $12.00
Kohler's Hercules.....₰ doz. $10.00
Kohler's Invincible.....₰ doz. $9.00
Kohler's Rival.....₰ doz. $8.00
Kohler's Pioneer.....₰ doz. $7.20
Never-Break Post Hole Diggers, ₰ doz., $24.00.....60%
Samson, ₰ doz. $34.00.....25%

Dividers—See *Compasses.*

Doors, Screen—

Phillips', style E, 7⅞ in....₰ doz. $10.00
Phillips', style 077, 7⅞ in....₰ doz. $7.50
Phillips', style x-y, 7⅞ in....₰ doz. $10.50

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ₰ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Diamond Emery Wheel Dressers....35%
Diamond Wheel Dresser Cutters....35%

Drills and Drill Stocks—

Common Blacksmiths' Drill, each .....$1.50@$1.75
Breast, Millers Falls.....15&10%
Breast, P. S. & W.....40&5%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills, Nos. 2 and 3.....16⅔%
Johnson's Drill Points.....16⅔%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....33⅓%
Ratchet, Whitney's, P. S. & W..50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....60&10&10@70%
Taper and Straight Shank..... 60&10@60&10&5%

Drivers, Screw—

Screw D'ver Bits, per doz..45@60¢
Balsey's Screw Holder and Driver, ₰ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9 .....40%
Buck Bros.' Screw Driver Bits.....30%
Champion 50%
Edson 60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Gay's Double Action Ratchet.....35%
Goodell's Auto..50&10&10@50&10&10&5%
Hurwood 40%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40&10%
Millers Falls, Nos. 20 and 21 ..25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
Never Turn.....60
New England Specialty Co.....50%
Sargent & Co.'s:
Nos. 1 and 60.....50&10&10%
Nos. 50 and 55.....60&10%
Nos. 20 and 40.....70&10%
Smith & Hemenway Co.....40&5%
H. D. Smith & Co.'s Perfect H'dle.40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles.....65%
No. 86.....75%
Victor 55%
Defiance 70%
Swan's:
Nos. 65 to 68.....50%
No. 40.....40&10%
Nos. 25, 35 and 45.....20&10&10%

Eave Trough, Galvanized—

Territory.	*L. C. L.*
Eastern	.....80&5%
Central	.....75&10&10%
Southern	.....75&12½%
So. Western	.....75&5%

Terms.—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:

Galv. Steel and Galv. C. C. Iron and Steel, Standard Gauge	*60&10%*
No. 26	.....35%
No. 24	.....25%
No. 22	.....10%
Copper	.....37½%
Perfect Elbows (S., S. & Co.)	.....40%

Emery, Turkish—

	4to6	*5½ to 180*	*Flour*
Kegs	*.lb. 5 ¢*	*5½¢*	*3¼¢*
½ Kegs	*.....lb. 5¼¢*	*5¾¢*	*3¾¢*
¼ Keys	*.....lb .5½¢*	*6 ¢*	*4 ¢*
10-lb. cans, 10 in case....6½¢		*7 ¢*	*6 ¢*
10-lb. cans, less than 10.....10 ¢		*10 ¢*	*8 ¢*
Less quantity..10 ¢		*10 ¢*	*8 ¢*

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's .....50&10%
Walling's 45%

Cord and Weight—

Ives 40%

Faucets—

Cork Lined.....50@50&10%
Metallic Key, Leather Lined..60&10@70%
Red Cedar.....40&10@50%
Petroleum.....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined..50%
John Sommer's Reliable Cork Lined..50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
McKenna, Brass:
Burglar Proof, N. P.....25%
Improved, ¾ and ⅞ inch.....25%
Self Measuring:
Enterprise, ℔ doz. $36.00.....40&10%
Lane's, ℔ doz. $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List revised Nov. 1, 1899.
Best Brands.....70&10@75&5%
Standard Brands.75&10@75&10&10%
Lower Grade....75&10&10@80&10%

Imported—

Stubs' Tapers, Stubs' list, July 2½, '97.....33 1-3@40%

Fixtures, Fire Door—

Richards Mfg. Co.:
Universal, No. 103.....$4.00
Special, No. 104.....$4.00
Fusible Links.....$0.25
Expansion Bolts.....50&10%

Grindstone—

Net Prices:

Inch	15	17	19	21	24
Per doz.	$2.15	2.85	3.25	3.75	4.50

P., S. & W. Co.....30&10@40%
Reading Hardware Co.....60%
Sargent's.....70%
Stowell's Giant Grindstone Hanger..℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy.....50&10&10%
Stowell's Grindstone Fixtures, Light..60&10%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....60%
Victor, Header.....60%
Champion, Hay.....60%
Champion, Header.....60%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Saw—

White, S'g't Bar, per doz..75@80¢
Red, S'g't Bar, per doz...$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	1	2	3	4	6
Each	$1.30	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—

See *Pans, Fry.*

Fuse—

Per 1000 Feet.

Hemp.....$2.75
Cotton.....3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15
10&2½%

Gates, Molasses and Oil—

Stebbins' Pattern.80&10@80&10&5%

Gauges—

Marking, Mortise, &c......50&10&5@50&10&10&5%
Chapin-Stephens Co.:
Marking, Mortise, &c.50&10@50&10&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....50@50&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....35%
Marking and Mortise.....60%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....30&10%

Gimlets— Single Cut—

Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co.....60@60&10&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush..25@50%
Cans (½ pts., pts., qts., ½ gal., gal.).....25@48%
International Glue Co. (Martin's)...40&10%

Grease, Axle—

Common Grade....*gro. $4.50@5.50*
Dixon's Everlasting..10-lb pails, ea. 85¢
Dixon's Everlasting, in boxes, ℔ doz. 1 lb, $1.20; 2 lb, $2.00

Grips, Nipple—

Perfect Nipple Grips.....40&10&2%

Griddles, Soapstone—

Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—

Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, per inch, ℔ doz.....$2.00 } 33⅓%
Pike Mower and Tool Grinder, each.....$6.00 } 33⅓%
Velox Ball Bearing, Mounted, Angle Iron Frames, each.....$3.25

Halters and Ties—

Covert Mfg. Co.:
Web.....35&5%
Jute Rope.....50%
Sisal Rope.....30&10%
Cotton Rope.....45%
Hemp Rope.....45%
Covert's Saddlery Works:
Web and Leather Halters.....70%
Jute and Manila Rope Halters.....70%
Sisal Rope Halters.....60&20%
Jute, Manila and Cotton Rope Ties.....70%
Sisal Rope Ties.....60&10%
E. T. Rugg & Co.:
Leather Halters.....50%
Web Halters and Webbing.....60%
Jute and Sisal Rope Halters.....60%
Jute and Sisal Horse and Cattle Ties.....60%
Cotton Horse Ties.....60%
Livery Ties, Braided.....60%

Hammers—

Handled Hammers—

Heller's Machinists'...40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....50%
Peck, Stow & Wilcox.....40&10&5%
Fayette R. Plumb:
Plumb, A. E. Nail.....33⅓&7⅛@33⅓&10&7⅛%
Engineers' and B. S. Hand.....50&7⅛&5@50&10&7⅛&5%
Machinists' Hammers.50&5@50&10&5%
Riveting and Tinners'.....40&2½@40&10&2½%
Sargent's C. S. New List.....40%

Heavy Hammers and Sledges—

Under 3 lb., per lb. 50¢.....80&10&10@85%
3 to 5 lb., per lb. 40¢.....80&10&10@85%
Over 5 lb., per lb 30¢..85@85&10%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—

Agricultural Tool Handles

Axe, Pick, &c.....60&5@60&10&5%
Hoe, Rake, &c.....45@50&5%
Fork, Shovel, Spade, &c.:
Long Handles.....45@50&5%
D Handles.....40%

Cross-Cut Saw Handles—

Atkins'.....40&5%
Champion.....45@45&10%
Disston's.....50%

Mechanics' Tool Handles—

Auger, assorted...*gro. $2.50@$2.85*
Brad Awl.....*gro. $1.65@$1.85*
Chisel Handles:
Apple Tanged Firmer, gro. assorted.....$2.40@$2.65
Hickory Tanged Firmer, gro. assorted.....$2.15@$2.40
Apple Socket Firmer, gro. assorted.....$1.75@$1.95
Hickory Socket Firmer, gro. assorted.....$1.45@$1.60
Hickory Socket Framing, gro. assorted.....$1.60@$1.75
File, assorted....gro. $1.30@$1.40
Hammer, Hatchet, Axe, &c. 60&10@60&10&10%
Hand Saw, Varnished, doz. 80&85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted.75¢
Fore, doz. 45¢; Fore, Bolted.90¢
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel.....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles.....15&10%
Nicholson Simplicity File Handle....℔ gro. $0.85@$1.50

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.

Barn Door, New Pattern, Round Groove, Regular:

Inch	3	4	5	6	8
Single Doz.	$0.90	1.25	1.60	1.95	2.50

Barn Door, New England Pattern, Check Back, Regular:

Inch	3	4	5	6
Single Doz.	$1.30	1.85	2.50	3.00

Allith Mfg. Co.:
Reliable, No. 1.....per doz. $8.00
Reliable, No. 2.....per doz. $9.60
Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....30%
Railroad.....50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10&5%
Roller Bearing.....75&5%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00.....70%
Roller Bearing, No. 11, $15.00.70%
Roller Bearing, Ex. Hy., No. 22, $18.00.....70%
Hinged Hangers, $16.00....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing.....$4.00
Parlor, Standard.....$3.15
Parlor, No. 105.....$2.85
Parlor, New Model.....$2.80
Parlor, New Champion.....$2.25
Barn Door, Standard.60&10&2½%
Hinged.....net $6.40
Covered.....60&10%
Special.....70&5%
Lawrence Bros.:
Advance.....60&10%
Cleveland.....70&5
Clipper, No. 75.....60%
Crown.....60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.....60%
Giant.....60&5%
Hummer.....70&5%
New York.....60&10%
Peerless.....70&5%
Sterling.....60&10%
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50
Meyers' Stayon Hangers.....60%
Richards Mfg. Co.:
Pioneer Wood Track No. 3..$2.15
Ball B'r'g St'l Track No. 10..$2.40
Roller B'r'g St'l Track No. 12..$2.30
Ball B'r'g St'l Track No. 13..$2.40
Roller B'r'g St'l Track No. 14..$2.30
Hero, Adj. Track No. 19.....50%
Adjustable Track Tandem Trolley Track No. 16.....50%
Seal, Steel Track No. 8.....$2.40
Auto Adj. Track No. 22..40&10%
Trolley B. D. No. 17.....$1.40
Trolley F. D. No. 120.....$2.35
Trolley F. D. No. 121.....$2.45
Trolley F. D. No. 150.....$2.60
Safety Underwriters F. D. No. 101.....$2.25
Tandem No. 44.....70&5%
Trolley F. D. No. 151.....$3.00
Palace, Adjustable Track No. 132.....40&10%
Royal, Adjustable Track No. 122.....40&10%
Ives' Wood Track No. 1.....$2.15
Trolley B. D. No. 20.....$1.35
Trolley B. D. No. 24.....$1.45
Trolley B. D. No. 27.....$1.50
Trolley B. D. No. 28.....$1.66
Roller Bearings Nos. 39, 40, 41, 43, 44.....70&5%
Anti-friction No. 42.....60&10%
Hinged Tandem No. 48.....60%
Folding Door B. B. Swivel No. 135.....30%
Safety Door Hanger Co.:
Storm King Safety.....60%
U. S. Standard Hinge.....60%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing....40%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas.....60%
Baggage Car Door.....50%
Climax Anti-Friction.....50&10%
Elevator.....40%
Express.....50%
Freight Car Door.....60%
Interstate.....60&10%
Lundy Parlor Door.....50&10%
Magic.....60%
Matchless.....60&10%
Nansen.....70&5%
Parlor Door.....50&10%
Railroad.....50&10%
Rex Hinge Door.....60%
Street Car Door.....50%
Steel, Nos. 300, 404, 500....50&10%
Underwriters' Fire Door.....40%
Wild West Warehouse Door..50%
Zenith for Wood Track....50&10%
A. L. Sweet Iron Works:
Check Back.....70%
Climax Anti-Friction.....50&10%
Eagle.....70%
Hylo Hinge.....60%
New Perfection.....60%
Pilot.....60%
Pilot Hinge.....60%
Rider Wooster.....65%
Western Pattern.....70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing.....60&10%
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
Dwarf Ball Bearing.....40%
Ives, Wood Track.....60&10%
L. T. Roller Bearing..60&10&5%
New Era Roller Bearing..50&10%
O. K. Roller Bearing..60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing....60&10%
Tandem, Nos. 1 and 2.....60%
Underwriters' Roller Bearing..40%
Velvet.....50%
Wilcox Auditorium Ball B'r'g..20%
Wilcox Barn Trolley No. 125..40%
Wilcox Ely. Door, Nos. 112 and 122½.....50%
Wilcox Ely. Door, No. 132....40%
Wilcox Fire Trolley, Roller Bearing.....30%
Wilcox Le Roy Noiseless Ball Bearing.....40%
Wilcox New Century..50&10&10%
Wilcox O. K. Steel Track....50%
Wilcox O. K. Trolley.....50%
Wilcox Trolley Ball Bearing..40%
Wilcox Wideman Narrow Gauge Ball Bearing.....40%

Extra 10% often given.

For Track, see Rail.

Hangers— Garment—

Pullman Trouser, ℔ gro., No. 1, $9.00; No. 4, $24.00; No. 7, $7.50.
Victor Folding.....℔ gro. $9.60
Western, W. G. Co.....70&10%

Gate—

Myers' Patent Gate Hangers, ℔ doz. net.....$4.50

Hasps—

Griffin's Security Hasp.....50%
McKinney's Perfect Hasp, ℔ doz..50%

Hatchets—

Regular list, first quality.40&7½%
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—

Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50.....15%
Clark Coal, ℔ doz. $0.75.....10%

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	3	5
Doz. pair	$0.75	1.35	2.70

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	1	1½	2	2½
Doz. pair	$0.70	.65	.60	.55

Mortise Reversible Shutter (Buffalo, &c.):

No.	1	1½	2
Doz. pair	$0.70	.65	.60

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Parker.....70&10&5%
Reading's Gravity.....60%
Sargent's, Nos. 1, 3, 5, 11 and 13..75%
Stanley's Steel Gravity Blind Hinges, ℔ doz. sets, without screws, $0.90; with screws, $1.20.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&10&5%
Acme, Lull & Porter.....75&10%
Queen City Reversible.....75&10%
Shepard's Noiseless, Nos. 60, 65, 55.....75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
1868, Old Pat'n, Nos. 1, 3 & 5.....75&10&5%
Tip Pat'n, Nos. 1, 3 & 5...75&10&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75.75%
Steamboat Gravity Locking, No. 10.75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with L'Ves.	$2.00	2.70	5.00
Hinges only.....	1.40	2.05	3.80
Latches only.....	.70	.70	.35

New England:
With Latch.....*doz.*....@$2.00
Without Latch...*doz.*....@$1.60
Reversible Self-Closing:
With Latch.....*doz.*....@$1.75
Without Latch...*doz.*....@$1.35
Western:
With Latch.....*doz. $1.75*
Without Latch.....*doz. $1.15*
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets,

No.	1	2	3
Hinges with Latches.	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Pivot Hinges—

Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....45%

Spring Hinges—

Holdback Cast Iron.....*gro. $9.00@$9.50*
Non-Holdback, Cast Iron.....*gro. $8.00@$8.50*

J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....45%
Bardsley's Patent Checking..15%
Bommer Bros.:
Bommer Ball Bearing Floor Hinges.....40%
Bommer Spring Hinges.....40%
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor Hinge.....50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American.....30%
Columbia, No. 14.....℔ gr. $9.00
Columbia, No. 18.....℔ gr. $25.00
Columbia, Adjustable, No. 7 ℔ gr. $12.00
Gem, new list.....30%
Clover Leaf.....℔ gr. $12.50
Oxford, new list.....30%
Lawson Mfg. Co., Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges.....40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....$9.00
Chief Ball B'r'g Floor Hinge.50%
Ohio Detachable Screen Door Hinge.....℔ gr. $12.00
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ℔ gr. $12.50
Ideal, No. 4.....℔ gr. $9.00
New Idea No. 1.....℔ gr. $9.00
New Idea, Double Acting....45%
New Idea Floor.....45%
Van Wagoner:
Ball Bearing.....25%
No. 777 Sh't Steel Holdb'k.℔ gro. pr.$9

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges..70%
H'vy Strap H'g's...75&5%
Light T Hinges.....65%
Heavy T Hinges.....60%
Extra H'y T H'g's.70&10%
Hinge Hasps.....50%
Cor. Heavy Strap...75&5%
Cor. Ex. Heavy T.70&10%

Extra 10&10&5%

Screw Hook and Strap. { *6 to 12 in..lb. 3½¢* / *1¼ to 20 in..lb. 3¼¢* / *22 to 36 in..lb. 3 c*

Screw Hook and Eye:
¾ to 1 inch.....lb. 6 ¢
⅝-inch.....lb. 7 ¢
½-inch.....lb. 9 ¢

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers....35%

Hods— Coal—

	Per doz.			
Inch	*15*	*16*	*17*	*18*
Galv. Open	*$2.50*	*2.75*	*3.00*	*3.25*
Jap. Open	*$1.90*	*2.10*	*2.25*	*2.55*
Galv. Funnel	*$3.00*	*3.30*	*3.60*	*3.90*
Jap. Funnel	*$2.45*	*2.65*	*2.85*	*3.30*

Masons, Etc.—

Cleveland Wire Spring Co.:
Steel Mortar.....each $1.45
Steel Brick.....each $1.10

Hoes— Eye—

Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23, 1899.....
70&10@75&10%
D. & H. Scovil.....35%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ℔ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....℔ doz. 66⅔%
Junior Size.....℔ doz. $4.00
Ft. Madison Sprouting Hoe..℔ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....
75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.15
B. B., 6½ in.....$3.35
Acme Wedding.....℔ doz., net, $4.35
W. & C. L'tning Shuffle Hoe,℔doz.$4.85

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ℔ doz. $24.00.....45&10%

Door—

Bardsley's.....45%
Empire.....50%
Pullman.....50%

File and Tool—

Nicholson File Holders and File Handles.....33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, ℔ gross, $10.80; ℔ doz.....$1.25

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Bird Cage, Sargent's List.....60&10%
Ceiling, Sargent's List.....50&10&10%
Clothes Line, Reading List.....40%
Clothes Line, Sargent's List.50&20&10%
Coat and Hat, Sargent's List...50&10%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....62½%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—

Belt .....80&10@..%
Wire C. & H. Hooks:.....
75&10@75&10&5%
Atlas, Coat and Hat:
Single Cases.....75%
10 Case Lots.....75&10%
Columbian Hdw. Co., Gem.....60&10%
Parker Wire Goods Co., King..75&10%
Van Wagoner, Coat and Hat.....70%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme.....60&10%
Chief.....70%
Crown.....70&10%
Czar.....65%
V Brace.....70&10%
Czar Harness.....50&10%

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton .....doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz. $4.75; Medium, $5.35; Heavy, $6.25
Grass, best, all sizes, per doz.$1.50
Grass, common grades, all sizes, per doz.....$1.30
Whiffletree .....lb. 5¾@6¢
Hooks and Eyes:
Brass .....60&10&5@60&10&10%
Malleable Iron..70&10@70&10&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....35%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Ft. Madison Cut-Easy Corn Hooks, ℔ doz. $3.25 net
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition .....ft. 5 @ 6 ¢
3-ply Standard.....ft. 8 @ 9 ¢
4-ply Standard.....ft. 10 @11 ¢
3-ply extra.....ft. 11 @13 ¢
4-ply extra.....ft. 14 @16 ¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8 @ 9 ¢
Fair Quality.....ft. 10 @11 ¢

Irons—Sad—

From 4 to 10.....lb. 2¾@3 ¢
B. B. Sad Irons.....lb. 3¼@3½¢
Chinese Laundry....lb. 4¾@5 ¢
Chinese Sad.....lb. 4 @4¼¢
Mrs. Potts', cents per set:

Nos.	*50*	*55*	*60*	*65*
Jap'd Tops....	62	59	72	69
Tin'd Tops....	*65*	*62*	*75*	*72*

New England Pressing..lb. 3¾@4¢

Pinking—

Pinking Irons.....doz. 50@60¢

Soldering—

Soldering Coppers, 2½ & 3..20@21¢
1½ & 2.....22@23¢

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&2%
Steel.....45%
Covert's Saddlery Works:
Daisy.....60&10%
Victor.....60%
Lockport.....50%
Lane's Steel.....30&10&5%
Richards' Tiger Steel, No. 130.....40%

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Smith & Hemenway Co.....40&10%
Wilkinson Shear & Cutlery Co.....50%

Corn—

Withington Acme, ℔ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....75%
C. E. Jennings & Co., Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42.....60%
Ohio Tool Co.'s.....70%
Swan's.....70&10&2½%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge..per doz..$5.25@5.50
Iwan's Sickle Edge.....℔ doz. $9.50
Iwan's Serrated.....℔ doz. $10.00

Mincing—

Buffalo.....℔ gro. $13.00

Miscellaneous—

Farriers' .....doz. $3.00@3.25
Wostenholm's .....℔ doz. $3.00@3.25

Knobs—

Base, 2¼-inch, Birch, or Maple, Rubber tip.....gro.$1.15@1.20
Carriage, Jap., all sizes.....
gro. 40@45¢
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%
Picture, Sargent's.....60&10&10%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....40%
Climax Shelf, No. 113.....40%
Trolley, No. 109.....40%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....25%
P. S. & W.....50%
Reading.....60%
Sargent's.....50&10%

Lanterns—Tubular—

Regular Tubular, No. 0.....
doz. $4.25@5.85
Lift Tubular, No. 0.....
doz. $4.50@5.15
Hinge Tubular, No. 0.....
doz. $4.50@5.15
Other Styles.....40&10@40&10&5%

Bull's Eye Police—

No. 1, 2¾-inch.....$2.50@2.75
No. 2, 3-inch.....$2.75@3.00

Lasts and Stands, Shoe—

Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—

Roggin's Latches, with screw..
doz. 35@40¢

Door—

Richards' Bull Dog, Heavy, No. 125.40%
Richards' Trump, No. 127.....50%

Leaders, Cattle—

Small.....doz. 50¢; large, 60¢
Covert Mfg. Co., Cotton and Hemp.45%

Lifters, Transom—

R. & E.....33⅓%

Lines—

	10	*12*	*14*
Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.20*	*2.00*	*1.65*
75 feet	*$1.80*	*1.70*	*1.30*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....℔ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Anniston Waterproof Clothes, 50 ft., ℔ gro., $24.00; Gilt Edge, $22.00; Air Line, $22.00; Acme, $17.00; Alabama, $15.00; Empire, $14.00; Advance, $13.50; Oriole, $20.00; Albemarle, $13.50; Eclipse, $12.50; Chicago, $11.00; Standard, $10.00; Columbia, $8.50; Allston, $12.50; Calhoun, $11.00.

Locks— Cabinet—

Cabinet Locks...33⅓@33⅓&7½%

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....40%
Sargent & Co.....40&10%
Stowell's Steel Door Latches.....50%

Elevator—

Stowell's.....Net

Padlocks—

Wrought Iron....75&10&5@80&8%
R. & E. Mfg. Co. Wrought Steel and Brass.....75@75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass.....62½%
Crescent.....50&10%
Iron.....62½%
Window Ventilating.....60%
Robison Patent Ventilating Sash Lock.....40%
Wrought Bronze and Brass.....55%
Wrought Steel.....55%
Pullman Patent Ventilating Lock..25%
Reading.....40%

Machines—Boring—

Com. Upr't, without Augers..$2.00
Com. Ang'l'r, without Augers.$2.25
Without Augers.

R. & E. Mfg. Co.:	Upright.	Angular.
Improved No. 3..	$4.25	No. 1..$5.00
Improved No. 4..	3.75	No. 2.. 3.38
Improved No. 5..	2.75	
Jennings', Nos. 1 and 4		35&5%
Millers' Falls		5.75
Snell's, Rice's Pat.	2.50	2.75

Corking—

Reisinger Invincible Hand Power....
℔ doz. $48.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.....20%

Ice Cutting—

Chandler's.....12½%

Washing—

Boss Washing Machine Co.: Per doz.
Champion Rotary Banner No. 1..$54.00
Standard Champion No. 1.....$48.00
Standard Perfection.....$26.00
Cinti Square Western.....$30.00
Uneeda American, Round.....$29.00

Mallets—

Hickory .....45&5@50%
Lignumvitæ .....45&5@50%
Tinners' Hickory and Apple-wood .....doz. 45&5@50%

Mangers, Stable—

Swett Iron Works.....50%

Mashers, Vegetable—

Western, W. G. Co., Potato....60&10%

Mats, Door—

Elastic Steel (W. G. Co.).....10%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....25&30%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria.50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheap .....all sizes, $1.75@2.00
Good .....all sizes, $2.25@2.50

	10	*12*	*14*	*16-in.*
High Grade	*4.25*	*4.50*	*4.75*	*5.00*

Continental.....60&5%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania.....60&5%
Pennsylvania, Jr., Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Philadelphia:
Styles M., S., C., K., T.....70&5%
Style A, all Steel.....60&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.50%

Nails—

Wire Nails and Brads, Papered, List July 20, 1899..85&10&10@90%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	*6*	*7*	*8*	*9*	*10*	
Anchor	23	21	20	19	18	...40&5%
Champlain	28	26	25	24	25	.....50%
Coleman	13	12	12	11	11	.....net
New Haven..	23	21	20	19	18	...40&5%
Putnam	23	21	20	19	18	....33⅓%
New Putnam.	19	18	17	16	16	..10&10%

Western.....℔ lb 8½¢
Jobbers' Special Brands.....
per lb. 8½@10¢

Picture—

	1½	*2*	*2½*	*3*	*3½ in.*
Brass H'd.	*.45*	*.55*	*.60*	*.70*	*.. gro*
Por. Head...	*1.10*	*1.10*	*1.10*		*.. gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: *Off list.*
Mfrs. or U. S. Standard.
Square, Blank.....$5.00
Hexagon, Blank.....$5.50
Square, Blank, C. T & R..$5.25
Hexagon, Blank, C. T. & R. 5.90
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square, Blank.....$5.50
Hexagon, Blank.....$5.90
Square, Tapped.....$5.40
Hexagon, Tapped.....$5.80

Oakum—

Best or Government.....lb. 6½¢
Navy .....lb. 5 ¢
U. S. Navy.....lb. 6 ¢
Plumbers' Spun Oakum.....2½¢
In carload lots ¼¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper.....50&10%
Tin or Steel.....65&10%
Zinc .....65&10%
Chase or Paragon:
Brass and Copper.....50&10%
Tin or Steel.....65&10%
Zinc .....65&10%
Malleable, Hammers' Imp'ed, No. 1, $3.60; No. 2, $4; No. 3, $4.40.℔ doz. 20%
Malleable, Hammers' Old Pattern, same list.....50&10%
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can—

	Per doz.
Sprague, Iron Handle	*.30@35¢*
Sprague, Wood Handle	*.35@40¢*
Sardine Scissors	*.$1.75@$3.00*
National	.50%
Stowell's Sprague	℔ doz. 35@45¢

Egg—

Nickel Plate.....℔ doz., $2.00
Silver Plate.....℔ doz., $4.00

Packing—

Asbestos Packing, Wick and Rope .....lb. 14@16¢

Rubber—

(Fair quality goods.)
Sheet, C. I.....8@10¢
Sheet, C. O. S.....9@13¢
Sheet, C. B. S.....10@14¢
Sheet, Pure Gum.....50@65¢
Sheet, Red.....40@50¢
Jenkins' '96, ℔ lb 80¢.....25@25&5%

Miscellaneous—

American Packing...lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@12½¢
Jute .....lb. 4@ 4½¢
Russia Packing.....lb. 8@11 ¢

Pails, Creamery—

S. S. & Co., with gauges—No. 1, $6.25; No. 2, $6.50 ℔ doz.

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.60&10@60&10&12½%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz..	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz	*$1.95*	*2.25*	*2.80*	*3.15*

Roasting and Baking—

Regal, S., S. & Co., ℔ doz., Nos. 5, $4.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ℔ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ℔ gro.:

No.	40	50	60	140	150	180
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper

Asbestos: lb.
Building Felt.....6¢
Mill Board, sheet, 40x40 in., 1-32 to ½ in.....10¢
Roll Board, 1-16 in. and under .....6¢
Roll Board, 3-32 and ⅛ in. 8¢

33⅓%

Per roll
Rosin Sized Sheathing: 500 sq. ft.
Light weight, 25 lbs. to roll 35@40¢
Medium weight, 30 lbs. to roll, 40@45¢
Heavy weight, 40 lbs. to roll.. 56@60¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....$38.00@40.00
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—

1 ply (roll 300 sq. ft.), ton.... $32.50@$5.50
2 ply, roll 108 sq. ft.....55@60¢
3 ply, roll 108 sq. ft.....78@85¢
Slater's Felt (roll 500 sq. ft.).75¢
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.).....$2.75

Sand and Emery—

Flint Paper and Cloth.60@60&10%
Garnet Paper and Cloth....25%
Emery Paper and Cl'h.50&10@60%

Parers— Apple—

Advance .....℔ doz. $4.00
Baldwin .....℔ doz. $1.00
Bonanza Improved.....each $6.50
Daisy .....℔ doz. $4.00
Dandy .....each $7.50
Eureka Improved.....each $20.00
Family Bay State.....℔ doz. $15.00
Improved Bay State.....℔ doz. $36.00
Little Star.....℔ doz. $5.00
New Lightning.....℔ doz. $7.00
Reading 72.....℔ doz. $3.25
Reading 78.....℔ doz. $6.25
Rocking Table.....℔ doz. $6.20
Turn Table '98.....℔ doz. $6.00
White Mountain.....℔ doz. $5.00

Potato—

Saratoga .....℔ doz. $7.00
White Mountain.....℔ doz. $6.00

Picks and Mattocks—

List Feb. 23, 1899.....70&5@75%
Cronk's Handled Garden Mattock, ℔ doz., $6.40.....33⅓%

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass .....60@60&10%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—

Carload lots.
Standard, 2-6 in.....60%
Extra Heavy, 2-5 in.....70%
Fittings 75%

Pipe, Merchant—

Carload Lots.

	Steel.		*Iron.*	
	Blk.	*Galv.*	*Blk.*	*Galv.*
⅛ & ¼ in..	*67½*	*51½*	*65*	*49*
⅜ & ½ in..	*71½*	*59½*	*69*	*57*
¾ to 6 in..	*75½*	*65½*	*73½*	*63½*
7 to 12 in..	*70½*	*55½*	*68½*	*53*

Pipe, Vitrified Sewer—

Carload lots.
Standard Pipe and Fittings, 2 to 24 in.:
New England.....68%
New York and New Jersey.71%
Maryland, Delaware, E. Pa.75%
West. Pa. and West Va....71%
Virginia 76%
Ohio, Michigan and Ky....77½
Indiana 77%
NOTE.—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:

	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	8.50	9.50

Planes and Plane Irons—

Wood Planes—

Bench, first qual.....40&10%
Bench, Second qual.....50&10%
Molding .....33⅓&10%
Bailey's (Stanley R. & L. Co.).....40%
Chapin-Stephens Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality....50@50&10%
Molding .....33⅓@33⅓&10%
Toy and German.....40@40&10%
Chaplin's 60%
Ohio Tool Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality....50@50&10%
Molding .....33⅓@33⅓&10%
Adjustable Wood Bottom.....60%
Union 60%

Iron Planes—

Bailey's (Stanley R. & L. Co.).....40%
Chaplin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....35%
Ohio Tool Co.'s Iron Planes.....60%
Sargent's .....60&10%
Union 60%

Plane Irons—

Wood Bench Plane Irons.....25&10@50%
Buck Bros.....30%
Chapin-Stephens Co.....50@30&10%
Ohio Tool Co.....30%
Stanley R. & L. Co.....35%
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse.....℔ doz. $8.50

Plates—

Felloe .....lb. 3¾@4¼¢
Self-Sealing Pie Plates (S., S. & Co.), ℔ doz. $2.00.....50%

Pliers and Nippers—

Button Pliers.....75&10@80%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.

Gas Pipe..	*7*	*8*	*10*	*12-in.*
	$2.00	*$2.25*	*$3.00*	*$3.75*

Acme Nippers.....50@50&5%
Cronk & Carrier Mfg. Co.:
American Button.....75&10%
Cronk's 60%
Improved Button.....60&10%
Stub's Pattern.....50%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&10@40&10&10%
P., S. & W. Tinners' Cutting Nippers .....30@30&10%
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10&10%
Chapin's Imp. Brass Cor.40@40&10&10%
Pocket Levels.....30@30&10&10%
Disston's Plumbs and Levels.....70%
Disston's Pocket Levels.....70%
C. E. Jennings & Co.'s Iron.....33⅓%
C. E. Jennings & Co.'s Iron, Adjustable .....40&7½%
Stanley R. & L. Co.....45%
Stanley's Duplex.....35%
Woods' Extension.....33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ℔ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $9.00; No. 4, $12.00.....50%

Points, Glaziers'—

Bulk and 1-lb. papers,lb.8½@9 ¢
½-lb. papers.....lb.9 @9½¢
¼-lb. papers.....lb.9¾@10¼¢

Pokes, Animal—

Ft. Madison Hawkeye.....℔ doz. $3.25
Ft. Madison Western.....℔ doz. $4.00

Police Goods—

Manufacturers' Lists..25@25&5%
Tower's 25%

Polish—Metal—

Prestoline Liquid, No. 1 (½ pt.), ℔ doz., $3.00; No. 2 (1 qu.), $9.72.....40%
Prestoline Paste.....40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. $2.00; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25; ℔ gro., $12.00.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75; ℔ gro., $18.00.
Wynn's White Silk, ½ pt. cans, ℔ doz. $2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can....each, $0.65
Ladd's Black Beauty, gr. $10.00.....50%
Joseph Dixon's, ℔ gr. $5.75.....10%
Dixon's Plumbago.....℔ lb 25¢
Pireside .....℔ gr. $2.50
Gem, ℔ gr. $4.50.....10%
Japanese .....℔ gr. $3.50
Jet Black.....℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ℔ doz. $1.50
Wynn's:
Black Silk, 5 lb pail.....each 70¢
Black Silk, ½ lb box.....℔ doz. $1.00
Black Silk, 5 oz. box.....℔ doz. $0.75
Black Silk, ½ pt. liq.....℔ doz. $1.00

Poppers, Corn—

1 qt., Square.....gro. $9.00
1 qt., Round.....gro. $10.00
1½ qt., Square.....gro. $11.00
2 qt., Square.....gro. $13.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled 40%
Tinned 35%

Powder—

In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb.....each 15¢
Rifle, 1-lb.....each 25¢
In Kegs:
12½-lb. kegs.....$2.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb c. bk)	7.25	8.75

Robin Hood Sm'less Shot Gun..50&20%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....20@25%

Seal Presses—

Morrill's No. 1, ℔ doz., $20.00.....50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Cork—

Invincible Cork Puller.....$21.00

Pullers, Nail—

Cyclops 50%
Miller's Falls, No. 3, ℔ doz., $12.00.. 33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
Pelican, ℔ doz. $9.00.....40&10%
Scranton, Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B, No. 2, case lots..... ℔ doz. $6.00
Diamond B, No. 3, case lots..... ℔ doz. $5.50
Giant No. 1, ℔ doz. $18; No. 2, $16.50; No. ¾, $15.....40%

Pulleys, Single Wheel—

Inch	*1½*	*1¾*	*2*	*3*
Awning or Tackle, doz.	*$0.30*	*.45*	*.60*	*1.05*
Hay Fork, Swivel or Solid Eye. doz., ¼ in., $1.25; 5 in., $1.55				
Inch	*2*	*2¼*	*2½*	
Hot House, doz...	*$0.65*	*.85*	*1.20*	
Inch	*1¼*	*1½*	*1¾*	*2*
Screw, doz....	*$0.16*	*.19*	*.23*	*.30*
Inch	*1¾*	*2*	*2¼*	*2½*
Side, doz.....	*$0.25*	*.40*	*.55*	*.60*
Inch	*1½*	*1¾*	*2*	*2½*

Stowell's:
Ceiling or End, Anti-Friction..60&10%
Dumb Waiter, Anti-Friction..60&10%
Electric Light.....60%
Side, Anti-Friction.....60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1¾ and 2 in. .....16@19¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in..16@19¢
Acme.....1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in.. ℔ doz. 50¢
Grand Rapids All Steel Noiseless..50%
Ideal .....70&10%
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—

Cistern .....60@60&10%
Pitcher Spout.....80@80&10%
Wood Pumps, Tubing, &c..45@50%
Barnes Dbl. Acting (low list).....50%
Barnes' Pitcher Spout.....75&10&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....℔ doz. $7.20
Flint & Walling's, Fast Mail Hand, (low list).....55%
Flint & Walling's Fast Mail (low list) .....55&5%
Flint & Walling's Tight Top Pitcher.80%
National Specialty Mfg. Co., Measuring, $6.00.....30%
Mechanical Sprayer.....$7.20
Myers' Pumps (low list).....50%
Myers' Power Pumps.....50%
Myers' Spray Pumps.....50%

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch...	*2*	*2¼*	*2½*	*2¾*
	$2.20	*2.50*	*2.75*	*3.00*
Inch...	*3*	*3¼*	*3½*	*3¾*	*4*
	$3.30	*3.60*	*3.85*	*4.10*	*4.40*

Plunger Cup Leathers—Per 100:

Inch...	*2½*	*3*	*3½*	*4*
	$2.75	*3.85*	*5.00*	*6.00*

Punches—

Saddlers' or Drive, good..... doz. 50@75¢
Spring, single tube, good quality .....$1.75@2.00
Revolving (4 tubes)..... doz. $3.50@3.75
Bemis & Call Co.'s Cast St'l Drive.50%
Bemis & Call Co.'s Check.....55%
Morrill's No. 1 (A.B.C.), ℔ doz. $15.50
No. 2, ℔ doz. $22.50.....50%
Hercules, each $7.50.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Steel Screw, B. & K. Mfg. Co.....50%
Tinners' Hollow, P.,S.&W. Co.35@35&5%
Tinners' Solid, P., S. & W. Co., ℔ doz., $1.41.....60%

Rail—Barn Door, &c.—

Cast Iron Barn Door; Flange Screw Holes for Rd. Groove Wheels:

½	⅝	¾ in.	
$2.50	$3.00	$4.40	*100 feet.*

Angular for Sq. Groove Wheels:

Small.	*Med.*	*Large.*	
$2.00	*$2.70*	*$3.60*	*100 feet.*

Sliding Door, Painted Iron..... 2½@2¾¢
Sliding Door, Wrought Brass, 1¼ in., lb., 36¢ 30%
Allith Mfg. Co.:
No. 1, Reliable Hgr. Track, ℔ ft. 5½¢
No. 2, Reliable Hgr. Track, ℔ ft. 7¢
Cronk's:
Double Braced Steel Rail....℔ ft. 3¢
O. N. T. Rail.....2¾¢
Griffin's:
xxx, ℔ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, ℔ 100 ft., 1 in., $3.70; 1¼ in., $4.40.
O. N. T., ℔ 100 ft., 1 in., $2.75; 1¼ in., $3.50; 1½ in., $4.00.
Standard, 1¼ in.....℔ 100 ft. $4.00
Lawrence Bros.:
℔ 100 ft. No. 201, $4.00; No. 202, $4.40.
New York, 1 x 3-16 in., ℔ 100 ft. $2.75
McKinney's:
Hinged Hanger Rail, ℔ ft., 11¢..50%
None Better.....℔ ft. 3¾¢
Standard .....℔ ft. 4 ¢
Myers' Stayon Track.....60%
Richards' Mfg. Co.:
Common 1 x 3-16 in., $2.75; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail.....$4.40
Fire Door Track, ℔ ft., 2½ x ⅝, 15¢; 3½ x ⅝, 9¢.
Lag Screw Rail, No. 65.....40%
Gauge Trolley Track, ℔ ft., No. 31, 10¢; No. 32, 15¢; No. 33, 24¢.
Safety Door Hanger Co.'s Storm King Safety.....60%
Safety Door Hanger Co.'s U. S. Standard 60%
Stowell's:
Cast Rail.....℔ ft. 1¾¢
Steel Rail, Plain.....25%
Wrought Bracket, 1 3-16 in....℔ ft. 3¢
Wrought Bracket, 1½ x 5-16..℔ ft. 7¢
Swett's Hylo, ℔ ft. 11¢.....60%
P. L. B. Steel Rail.....℔ 100 ft. $3.00
No. 0, 1 x 3-16.....℔ 100 ft. $2.75

Rakes—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Jackson Lawn, 29 and 30 teeth, ℔ doz., net.....$4.25
Cronk's:
New Champion Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00..75%
Victor Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00....75&25%
Queen City Lawn, ℔ doz., 20 teeth, $3.45; 24, $3.60.....
Anticlog Lawn, ℔ doz.....$4.00
Malleable Garden.....70&10%
Kohler's:
Lawn Queen, 20-tooth.....℔ doz. $3.45
Lawn Queen, 24-tooth.....℔ doz. $3.60
Paragon, 20-tooth.....℔ doz. $2.75
Paragon, 24-tooth.....℔ doz. $3.00
Steel Garden, 14-tooth....℔ doz. $2.88
Malleable Garden, 14-tooth, ℔ doz. $1.75@2.00
Weldless Steel Garden.....75&5%

Rasps, Horse—

Disston's 75%
Heller Bros.'.....70&5@70&10&5%
McCaffrey's American St'd...60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—

Borasic 60%
Fox Razors, No. 42..℔ doz. $20.00
Fox Razors, No. 44..℔ doz. $20.00
Fox Razors, No. 82, Platina... ℔ doz. $25.00 } Less 40%
Red Devil.....60%
Sage & Hatch:
Arbo Anti-Rust.....℔ doz. $10.00
Herbrand .....℔ doz. $6.00
Barber .....℔ doz. $6.00
Silberstein:
Carbo Magnetic.....$18.00
Griffon, No. 65.....$15.00
Griffon, No. 00.....$12.00
All other Razors.....40%

Safety Razors—

Silberstein 40%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum, German Silv., Bronze.25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P.....33⅓%
2904 PN.....33⅓%
0924 N.....33⅓%
02084 N.....33⅓%
002904 PN.....33⅓%
802 N.....33⅓%
986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*

Black Jap.....75%
Bronzed 75%

Revolvers—

Single Action.....95¢@$1.00
Double Action, except 44 cal.$1.85
Double Action, 44 caliber....$2.00
Automatic $3.45
Hammerless $4.00
NOTE.—Jobbers frequently cut the above prices of manufacturers for small trade.

Riddles, Hardware Grade

16 in.....per doz. $2.25@$2.50
17 in.....per doz. $2.50@$2.75
18 in.....per doz. $2.75@$3.00

Rings and Ringers—

Bull Rings—

	2	*2½*	*3 inch.*
Steel	*$0.70*	*0.75*	*0.80 doz.*
Copper	*$1.00*	*1.15*	*1.40 doz.*

Rea's Improved Self-Piercing, Copper, 2 in., ℔ doz., $1.25; 2½ in., $1.50; 3 in., $1.75.

Hog Rings and Ringers—

Hill's Rings, gro. boxes.$4.00@4.50
Hill's Ringers, Gray Iron..... doz. 50@55¢
Hill's Ringers, Malleable Iron.. doz. 70@75¢
Blair's Rings...per gro.$4.75@5.25
Blair's Ringers.per doz. $0.60@ .65
Brown's Rings..per gro.$5.00@5.50
Brown's Ringers.per doz.$0.60@ .65

Rivets and Burrs—

Copper .....50&10@60%
Iron or Steel.....75@75&5%

Rollers—

Acme, Stowell's Anti-Friction.....50%
Barn Door, Sargent's list.....60%
Cronk's Stay.....72¢
Cronk's Brinkerhoff.....90¢
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.50%
O. K. Adj. and Reversible No. 56.50%
Lag Screw, Nos. 55 and 57.....50%
Fire Door, No. 59.....40%
Favorite, No. 54.....40%
Stowell's Barn Door Stay..℔ doz. $1.00
Swett's Anti-Friction.....50%
Screw and Spike Stay.....℔ doz. 65¢
Hinge Adjustable Stay.....℔ doz. 90¢

Rope—

Manila, 7-16 in. diam. and larger:
Pure .....lb.11½@12¢
Sisal, 7-16 in. diam. and larger:
Mixed .....lb.8@8¼¢
Pure .....lb.9½@9¾¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed .....lb.8@8¼¢
Pure .....lb.9@9¼¢

Sisal, Tarred, Medium Lath Yarn:
Mixed ..... lb. 7¾¢
Pure ..... lb. 9¢
Cotton Rope: Lb.
Best, ¼-in. and larger ..... 16¢
Medium, ¼-in. and larger ... 14¢
Common, ¼-in. and larger . 10½¢
Jute Rope:
Thread No. 1, ¼-in. & up. lb. 6½¢
Thread No. 2, ¼-in. & up, lb. 5¾¢
Old Colony Manila Transmission Rope ..... ℔ lb 17½¢

Wire Rope—

Galvanized ..... 42½&2½%
Plain ..... 50&2½%

Ropes, Hammocks—

Covert Mfg. Co.:
Jute 50%
Sisal ..... 30&10%
Covert Saddlery Works..... 60&5%

Rulers, Desk—

Stimpson & Son:
Boxwood and Maple..... 30&10%

Rules—

Boxwood ..... 60&10&10%
Ivory ..... 35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood ..... 60@60&10%
Flexifold ..... 27½&10&10&2½%
Ivory ..... 35@35&10&10%
Miscellaneous ..... 50@50&10&10%
Combination ..... 55@55&10%
Stationers' ..... 10@10&10%
Keuffel & Esser Co.:
Folding, Wood..... 35&10%
Folding, Steel..... 33⅓&10%
Lufkin's Steel..... 50&10%
Lufkin's Lumber..... 60%
Stanley R. & L. Co.:
Boxwood 62½%
Ivory 45%
Miscellaneous 60%
Zig Zag..... 40%
Zig Zag, Pin Joint..... 42½%
Upson Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—

See *Balance, Sash.*

Sash Locks—

See *Locks, Sash.*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers

See *Stuffers or Fillers, Sausage.*

Saw Frames—

See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 50%
Band ..... 50&10@60%
Cross Cuts..... 35&5%
Mulay, Mill and Drag..... 50%
One-Man Saw..... 40%
Wood Saws..... 40%
Hand, Compass, &c..... 40%
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth.50%
Band, 2 to 14 in. wide..... 60%
Band, ⅛ to 1⅛..... 60%
Crosscuts 50%
Narrow Crosscuts..... 55%
Mulay, Mill and Drag..... 50%
Framed Woodsaws..... 35%
Woodsaw Blades..... 35%
Woodsaw Rods..... 25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination..... 30%
Compass, Key Hole, &c..... 25%
Butcher Saws and Blades..... 35%
C. E. Jennings & Co.'s:
Back Saws..... 25%
Butcher Saws..... 30%
Compass and Key Hole Saws..35&5%
Framed Wood Saws..... 30%
Hand Saws..... 20&2½%
Wood Saw Blades..... 35%
Millers Falls:
Butcher Saws..... 15&10%
Star Saw Blades..... 15&10%
Peace & Richardson's Hand Saws...30%
Simonds':
Circular Saws..... 50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts..... 40&10%
Gang Mill, Mulay and Drag Saws.50%
Band Saws..... 50%
Back Saws..... 25@25&7½%
Butcher Saws..... 35@35&7½%
Hand Saws..... 25@25&7½%
Hand Saws, Bay State Brand..... 40%
Compass, Key Hole, &c..25@25&7½%
Wood Saws..... 35@35&7½%
Springfield Mach. Screw Co.:
Diamond Kitchen Saws....40&10@50%
Butcher Saws Blades..... 35@40%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws..... 50%

Hack Saws—

Atkins' Hack Saw Blades A A A..25%
Disston's:
Concave Blades..... 25%
Keystone 40%
Hack Saw Frames..... 30%
Fitchburg File Works, The Best...25%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180.... 40&7½%
Hack Saws, Nos. 175, 180, complete. 40&7½%
Goodell's Hack Saw Blades..... 40%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&5&10%
Springfield Mach. Screw Co.:
Diamond Hack Saw Blades..... 35%
Diamond Hack Saw Frames..... 50%
Star Hack Saws and Blades..... 15&10%
Sterling Hack Saw Blades....30&10&5%
Sterling Hack Saw Frames...30&10&10%

Scroll—

Barnes' No. 7, $15..... 25%
Barnes' Scroll Saw Blades..... 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20..... 20%
Lester, complete, $10.00..... 15&10%
Rogers, complete, $4.00..... 15&10%

Scalers, Fish—

Covert's Saddlery Works..... 60&10%

Scales—

Family, Turnbull's .... 50@50&10%
Counter:
Hatch, Platform, ½ oz. to ¼ lbs. ..... doz. $5.50
Two Platforms, ½ oz. to 8 lbs. ..... doz. $16.00
Union Platform, Plain. $1.70@1.90
Union Platform, Stpd. $1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Crocers' Trip Scales..... 50%
Chicago Scale Co.:
The "Little Detective"....25 lbs 50%
Union or Family No. 2..... 60%
Portable Platform (reduced list)..50%
Wagon or Stock (reduced list).25@35%
"The Standard" Portables..... 50%
"The Standard" R. R. and Wagon.50%

Scrapers—

Box, 1 Handle ..... doz. $2.00@2.25
Box, 2 Handle ..... doz. $2.60@2.85
Ship .... *Light, $2.00; Heavy, $4.50*
Adjustable Box Scraper (S. R. & L. Co.), $6.00..... 45%
Chapin-Stephens Co., Box....50@50&10%

Screens, Window and Frames—

Air Line Pattern Screens..... 60&10%
Flyer Pattern Screens..60&10@60&10&5%
Maine Screen Frames..... 40&10&5%
Perfection Screens..... 60&10@60&10&5%
Phillips' Screen Frames...60&5@60&10%
See also *Doors.*

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1⅛, $3.00@3.25; 1¼ .$3.50@3.75
Bench, W'd, Beech .doz. 30@30&5%
Hand, Wood ..... 30@30&5%
R. Bliss Mfg. Co., Hand...30@30&10%
Chapin-Stephens Co., Hand..30@30&10%
Ohio Tool Co., Bench and Hand..30%

Coach, Lag and Hand Rail—

Lag, Cone Point, list Oct. 1, '99 ..... 75&17½%
Coach, Gimlet Point, list Oct. 1, '99 ..... 75&12½%
Hand Rail, list Jan. 1, '81 .... 70&10@75%

Jack Screws—

Standard List ..... 75&10@80&5%
Millers Falls..... 50&10&10%
Millers Falls, Roller..... 50&10%
P., S. & W..... 50@50&5%
Sargent ..... 70&10%
Swett Iron Works..... 75&10@80&5%

Machine—

List Jan. 1, '98:
Flat or Round Head, Iron .... 50@50&10%
Flat or Round Head, Brass .... 50@50&10%

Set and Cap—

Set (Iron) 80%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap 75%
Hex. Hd. Cap 75%
Rd. Hd. Cap ..... 60&10%
Fillister Hd. Cap ..... 60&10&10%

Wood—

List July 23, 1903.
Manufacturers' printed discounts:
Flat Head, Iron ..... 87½&10@... %
Round Head, Iron ... 85 &10@... %
Flat Head, Brass ... 85 &10@... %
Round Head, Brass .. 80 &10@... %
Flat Head, Bronze ... 77½&10@... %
Round Head, Bronze. 75 &10@... %
Drive Screws ..... 87½&10%

Scroll Saws—

See *Saws, Scroll.*

Scythes—

	Per doz.
Prices announced for next season:	
Clipper Pattern, Grass	$6.20
Full Polished, Clipper	$6.75
Grain	$8.00
Clipper, Grain	$8.25
Weed and Bush	$6.25

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Aiken's Sets, Awl and Tools:
No. 20, ℔ doz. $10.00..... 50&10&10%
Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7..... 50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18....15&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel..... ℔ doz sets $9.00
Octagon ..... *gro. $3.50@3.75*
Buck Bros..... 27½%
Cannon's Diamond Point, ℔ gro. $12..25%
Mayhew's ..... ℔ gro. $9.00
Snell's Cannon's Diamond Point.... ℔ gro. $7.20
Snell's Cor'gated, Cup Pt...℔ gro. $7.20
Snell's Knurled, Cup Pt....℔ gro. $7.20
Springfield Mach. Screw Co.:
Diamond Knurled Cup Pt. ℔ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Aiken's:
Genuine ..... 50&10%
Imitation ..... 50&10%
Atkin's:
Criterion 40%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut..... 30%
Plate 20%
Disston's Star and Monarch..... 25%
Morrill's No. 1, $15.00..... 50%
Nos. 3 and 4, Cross Cut, $20.63....50%
No. 5, Mill, $30.00..... 50%
Nos. 10, 11, 95, $15.63... ..... 50%
No. 1 Old Style, $10.00..... 50%
Special, $16.25..... 50%
Giant Royal, Cross Cut..... ℔ doz. $8.50
Royal, Hand..... ℔ doz. $5.00
Taintor Positive..... ℔ doz. $6.75

Shaving-

Fox Shaving Sets, No 30..... ℔ doz., net, $24.00

Sharpeners, Knife—

Chicago Wheel & Mfg. Co.....65%

Shaves, Spoke—

Iron ..... *doz. $1.10@1.25*
Wood ..... *doz. $1.75@2.25*
Bailey's (Stanley R. & L. Co.)....45%
Razor Edge (Stanley R. & L. Co.)..35%
Chapin-Stephens Co.....30@30&10&10%
Goodell's ℔ doz. $8.00..... 15&10%
Wood's F1 and F2..... 50%

Shears—

Cast Iron..	7	8	9 in.
Best	$16.00	18.00	20.00 gro.
Good ...	$13.00	15.00	17.00 gro.
Cheap ..	$5.00	6.00	7.00 gro.

Straight Trimmers, &c.:
Best quality Jap .... 70@70&10%
Best quality, Nickel . 60@60&10%
Fair quality, Jap .... 80@80&5%
Fail quality, Nickel . 75@7...&10%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears..... 40@40&5%
Heinisch's Tailor's Shears..... 10%
Wilkinson's Hedge, 1900 list..... 45%
Wilkinson's Branch, Lawn & Border.40%
Wilkinson's Sheep, 1900 list..... 50%

Tinners' Snips—

Steel Blades ..... 20&5@20&10%
Steel Laid Blades .... 40&10@50%
Forged Handles, Steel Blades, Berlin, 40@40&10%
Heinisch's Snips..... 40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in..... 50%
Niagara Snips..... 40%
P., S. & W. Co..... 20%

Pruning Shears and Tools

Cronk's Grape Shears..... 33⅓%
Cronk's Pruning Shears..... 33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00..... 25%
Disston's Pruning Hook, ℔ doz. $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades..40@40&5%
Orange Shears..... 50&10@50&20
Grape ..... 40&10@50
Tree Pruners..... 75
P., S. & W. Co..... 33⅓%

Sheaves—Sliding Door—

Stowell's Anti-Friction..... 50%
Patent Roller, Hatfield's, Sargent's list ..... 70&10%
Reading 40%
R. & E. list..... 33⅓%
Wrightsville Hatfield Pattern..... 80%

Sliding Shutter—

Reading list..... 40%
R. & E. list..... 33⅓%
Sargent's list..... 50&10%

Shells—Shells, Empty—

Brass Shells, Empty:
First quality, all gauges..... 60&5%
Climax, Club, Rival, 10 and 12 gauge ..... 65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge.25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge..20%
Climax, Union, League, New Rival, 10 and 12 gauge..... 25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ($7.50 list)..20%
Expert, Metal Lined and Pigeon, 10 12, 16 and 20 gauge..... 33⅓&5%
Robin Hood, Low Brass..... 20&10%
Robin Hood, High Brass..... 30&10%

Shells, Loaded—

Loaded with Black Powder.. 40%
Loaded with Smokeless Powder: medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Robin Hood Smokeless Powder:
Robin Hood, Low Brass..... 50%
Comets, High Brass..... 50&10&5%

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg *$4.00*
Steel ..... per keg *$3.75*
Burden's, all sizes..... ℔ keg $3.90

Shot—

Drop, up to B, 25-lb. bag *$1.65*
Drop, B and larger ..... *per 25-lb. bag, $1.90*
Buck, 25-lb. bag *$1.90*
Chilled, 25-lb. bag *$1.90*

Shovels and Spades—

Association List, Nov. 15, 1902. 40%

Sieves and Sifters—

Hunter's Imitation ..... *gro. $10.50@11.00*
Hunter's Genuine ..... *per gro. $12.00@12.50*
Buffalo Metallic Blued, S. S. Co., ℔ gr.:

14&16	16&18	18&20
$13.20	$13.50	$14.40

Shaker (Barler's Pat.) Flour Sifters, ℔ doz., $2.00..... 20%

Sieves, Seamless Metallic

	Per dozen.			
Mesh	14	16	18	20
Iron Wire....	$1.05	1.05	1.10	1.20
Tinned Wire..	$1.15	1.15	1.20	1.30

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested .... *doz. $0.90@0.95*
Mesh 20, Nested .... *doz. $1.00@1.05*
Mesh 24, Nested .... *doz. $1.30@1.40*

Sinks, Cast Iron—

Standard list ..... 60@60&10%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron..... 80&10@80&10&10%
Steel ..... 40@40&10%

Slates, School—

Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Uncecelled Noiseless .. 60&5 tens
Victor A, Noiseless ..... 60&4 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40@40&10%
Covert Mfg. Co.:
Derby ..... 30&2%
High Grade..... 40
Jockey 35%
Trojan 45%
Yankee ..... 30&2%
Yankee Roller..... 30&2%
Covert's Saddlery Works:
Crown 60%
German 60%
Model 60%
Triumph 60%
Oneida Community:
Solid Swivel..... 60%
Sargent's Patent Guarded....66⅔&10%

Snaths—

Scythe 50%

Snips, Tinners—See *Shears.*

Spoons and Forks—Silver Plated—

Good Quality..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton ..... 40&10%
Rogers & Bro., William Rogers' Eagle Brand..... 50&10%
Anchor, Rogers Brand..... 60%
Wm. Rogers & Son..... 60&10%

Miscellaneous—

German Silver..... 60@60&5%
Cattaraugus Cutlery Co.:
Seneca Silver..... 50%

Tinned Iron—

Teas ..... *per gro.* 45@50¢
Tables..... *per gro. $0.50@$1.00*

Springs— Door—

Chicago (Coil)..... 40&10%
Gem (Coil)..... 20
Pullman (Coil)..... 25%
Reliance (Coil)..... 40&10%
Star (Coil)..... 30
Torrey's Rod, 39 in..... ℔ doz. $1.10
Victor (Coil)..... 50&10&10%

Carriage, Wagon, &c.—

	Per lb
1¼ in. and Wider:	
Black	4@4¼¢
Half Bright.....	4@4¼¢
Bright	4½@4¾¢
Painted Seat Springs:	
1½ x 2 x 26.....	per pr. 42¢
1½ x 3 x 28.....	per pr. 70¢

Sprinklers, Lawn—

Enterprise ..... 25@30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $24..... 30%

Squares—

Nickel plated.. } *List Jan. 5, 1900.*
Steel and Iron. } 75&5@75&10%
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Sq. and T-Bevels....70%
Winterbottom's Try and Miter, No. 1, 40%; No. 2..... 50%

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... *doz. $1.00*
Good Grade..... *doz. $1.25*
Tinned Iron..... *doz. $0.75@1.25*
Iron, Porcelain Lined... *doz. $1.75*

Staples—

Barbed Blind..... lb. 6@6½¢
Electricians', Association list.. 80&10&10&10%
Fence Staples, Plain, $2.25; Galvanized *$2.55*
Poultry Netting Staples..... per lb. 3¼@3½¢
Grand Crossing Tack Co.'s list..80&10%

Steels, Butchers'—

Dick's 30%
Foster Bros..... 30%
C. & A. Hoffmann's..... 40%

Steelyards — .... 30@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates..... 25%
Gardner Die Stocks No. 1..... 50%
Gardner Die Stocks, larger sizes....40%
Green River..... 25%
Lightning Screw Plate..... 25%
Little Giant..... 25%
Reece's New Screw Plates..... 25%

Stone—Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., $8.00 ℔ gro., 12 in., $10.80.
Norton Emery Scythe Stones:
Less than gross lots..... ℔ gro. $9.00
One gross or more..... ℔ gro. $7.20
Lots of 10 gross or more..℔ gro. $6.00

Pike Mfg. Co., 1901 list:
Black Diamond S. S. ℔ gro. $12.00
Lamoille S. S. ℔ gro. $11.00
White Mountain S. S. ℔ gro. $9.00
Green Mountain S. S. ℔ gro. $6.00
Extra Indian Pond S. S. ℔ gro. $7.50
No. 1 Indian Pond S. S. ℔ gro. $7.00
No. 2 Indian Pond S. S. ℔ gro. $4.50
Leader Red End S. S. ℔ gro. $4.50
Emery and Corundum, 10 in. ℔ gro. $9.00 — 33⅓%
Pure Corundum, 10 in., ℔ gro. $12
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%

Oil Stones, &c.—

Chicago Wheel & Mfg. Co., 1901 list:
Gem Corundum Oil, Double Grit 50%
Gem Corundum Axe, Single or Double Grit 55%
Gem Corundum Slips 55%
Gem Corundum Razor Hones 50%
Pike Mfg. Co., 1901 list: ℔ lb.
Arkansas St. No. 1, 3 to 5½ in. $2.80
Arkansas St. No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1 $4.00
Lily White Washita, 4 to 8 in. 60¢
Rosy Red Washita, 4 to 8 in. 60¢
Washita St., Extra, 4 to 8 in. 50¢
Washita St., No. 1, 4 to 8 in. 40¢
Washita St., No. 2, 4 to 8 in. 30¢
Lily White Slips 90¢
Rosy Red Slips 90¢
Washita Slips, Extra 80¢
Washita Slips, No. 1 70¢
Washita Slips, No. 2 40¢ — 33⅓%
India Oil Stones (entire list) 33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit 33⅓%
Quickcut Emery and Corundum Axe Stone, Double Grit 33⅓%
Quickcut Emery Rubbing Bricks 33⅓%
Hindostan No. 1, R'g'lar. ℔ lb 8¢
Hindostan No. 1, Small ℔ lb 10¢
Axe Stones (all kinds)
Turkey Oil Stones, Extra, 5 to 8 in. ℔ lb 80¢ — 33⅓%
Queer Creek Stones, 4 to 8 in. 20¢
Queer Creek Slips 40¢
Sand Stone 6¢
Belgian, German and Swaty Razor Hones 50%
Natural Grit Carving Knife Hones ℔ doz. $3.00
Quick Edge Pocket Knife Hones ℔ doz. $2.50 — 40%
Mounted Kitchen Sand Stone. ℔ doz. $1.50

Stoners, Cherry—

Enterprise 25@30%

Stoppers, Bottle—

Victor Bottle Stoppers ℔ gro. $9.00

Stops—Bench—

Millers Falls 15&10%
Morrill's, ℔ doz., No. 1, $10.00 50%
Morrill's, No. 2, $12.50 50%

Door—

Chapin-Stephens Co. 60@60&10%

Plane—

Chapin-Stephens Co. 20%

Straps—Box—

Cary's Universal, case lots. 20&10&10%

Hame—

Covert's Saddlery Works 60&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket doz. $1.60
Excelsior Stretcher and Tack Hammer Combined, ℔ doz. $6.00 20%

Stuffers, Sausage—

Enterprise Mfg. Co. 25@25&7½%
National Specialty Co., list Jan. 1, 1902 30&5%

Sweepers, Carpet—

National Sweeper Co.: ℔ doz.
Auditorium, Roller Bearing (26 in. case), Nickel $54.00
Mammoth, Roller Bearing (30 in. case), Nickel $60.00
Marion, Roller Bearing, regular finishes, full Nickel $24.00
Marion Queen, Roller Bearing, full Nickel $24.00
Monarch, Roller Bearing, N'kel. $22.00
Monarch, Roller B'r'g, Jap'ned. $20.00
Transparent, Roller Bearing, Plate Glass Top, Nickel $36.00
Monarch Extra, Roller Bearing, (17-in. case), Nickel $36.00
Monarch Extra, Roller Bearing (17-in. case), Japanned $33.00
National Queen, Fancy Veneers. $27.00
Perpetual, Regular B'r'gs, Nkl. $20.00
Perpetual, Regular B'r'gs, Jap. $18.00
Triple Medal $24.00
NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Tacks, Finishing Nails, &c.

New List, May 1, 1905.

American Carpet Tacks 90¢&7½%
American Cut Tacks 90¢&7½%
Sucedes Cut Tacks 90¢&7½%
Sucedes Upholsterers' Tacks 90¢&50%
Gimp Tacks 90¢&50%
Lace Tacks 90¢&50%
Trimmers' Tacks 90¢&7½%
Looking Glass Tacks 65%
Bill Posters' and Railroad Tacks, 90¢&50%
Hungarian Nails 85%
Finishing Nails 70%
Trunk and Clout Nails 80&5%
NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10&5% is given on light weights.

Miscellaneous—

Double Pointed Tacks 90¢&6 or 7 cents
Steel Wire Brads, R. & E. Mfg. Co.'s list 50&10@60%
See also Nails, Wire.

Tanks, Oil—

	Each.
Emerald, S., S. & Co.	30-gal. $3.40
Emerald, S., S. & Co.	60-gal. $4.25
Queen City, S., S. & Co.	30-gal. $3.65
Queen City, S., S. & Co.	60-gal. $4.50

Tapes, Measuring—

American Asses' Skin 40¢10@50%
Patent Leather 25@30&5%
Steel 40@40&10%
Chesterman's 25@25&5%
Eddy Asses' Skin 40&10@50%
Eddy Patent Leather 25@30&5%
Eddy Steel 40@40&10%
Keuffel & Esser Co.:
Favorite, Ass Skin 40&10@50%
Favorite, Duck and Leather 25&5@25&10%
Metallic and Steel, lower list 35@35&5%
Pocket 35@35&5%
Lufkin's:
Asses' Skin 40&10@50%
Metallic 30@30&5%
Patent Bend, Leather 25&5@25&10%
Pocket 40@40&5%
Steel 33⅓@35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger per 100 lbs. $3.00

Thermometers—

Tin Case 80¢10@80¢10¢5%

Ties, Bale—Steel Wire—

Single Loop 80¢2½%
Monitor, Cross Head, &c. 70%

Brick Ties—

Niagara Brick Ties 25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works 60&10%

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White 20@20&5%

Hay—

Myers' Hay Tools 50%
Stowell's Hay Carriers 50%
Stowell's Hay Forks 50%
Stowell's Fork Pulleys 50%

Saw—

Atkins' Cross Cut Saw Tools 40%
Simonds' Improved 33⅓%
Simonds' Crescent 25%

Ship—

L. & I. J. White 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro. $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Oneida Pattern 75&10@75&10¢5%
Newhouse 45@45&5%
Hawley & Norton 60%
Victor and Oneida 70&10@70&10&5%
O. C. Jump (Blake Pat.) 60&5@60&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each $1.21; ℔ doz. $13.25
No. 3, Rat, ℔ doz. $6.50; case of 50 $5.75 doz.
No. 3½, Rat, ℔ doz. $5.25; case of 72 ℔ gro. $4.70 doz.
No. 4, Mouse, ℔ doz. $3.85; case of 150 $3.00 doz.
No. 5, Mouse, ℔ doz. $3.00; case of 150 $2.25 doz.

Trimmers, Spoke—

Wood's E I. 50%

Trowels—

Disston Brick and Pointing 30%
Disston Plastering 25%
Disston "Standard Brand" and Garden Trowels 35%
Kohler's Steel Garden Trowels, 5 in. ℔ gro. $4.80
Kohler's Steel Garden Trowels, 6 in. ℔ gro. $6.00
Never-Break Steel Garden Trowels.. ℔ gro. $6.00
Rose Brick and Plastering 25&5%
Woodrough & McParlin, Plastering 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern 50&10%
Western Pattern 60&10%
Handy Trucks ℔ doz. $16.00
Grocery ℔ doz. $15.00
Daisy Stove Trucks, Improved Pattern ℔ doz. $18.50
McKinney Trucks each $10.00
Model Stove Trucks ℔ doz. $18.50

Tubs, Wash—*No.* 1 2 3

Galvanized, per doz. $4.50 5.00 5.75
Galvanized Wash Tubs (S., S. & Co.):
No. 1 2 3 10 20 30
Per doz., net $5.70 6.30 7.20 6.60 7.20 8.10

Twine, Miscellaneous—

Flax Twine:	*BC.*	*B.*
No. 9, ¼ and ½-lb. Balls	*22@24¢*	
No. 12, ¼ and ½-lb. Balls	*18@20¢*	
No. 18, ¼ and ½-lb. Balls	*16@18¢*	
No. 24, ¼ and ½-lb. Balls	*16@18¢*	
No. 36, ¼ and ½-lb. Balls	*15@17¢*	
Chalk Line, Cotton ½-lb. Balls		*20¢*
Cotton Mops, 6, 9, 12 and 15 lb. to doz.		*9½@11¢*
Cotton Wrapping, 5 Balls to lb., according to quality	*13½@20¢*	
American 2-Ply Hemp, ¼ and ½-lb. Balls	*13@14½¢*	
American 3-Ply Hemp, 1-lb. Balls	*13@14½¢*	
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine)	*3½¢*	
India 3-Ply Hemp, 1-lb. Balls	*8½¢*	
India 3-Ply Hemp, 1½-lb. Balls.	*7@8¢*	
2, 3, ¼ and 5-Ply Jute, ½-lb. Balls	*9@10¢*	
Mason Line, Linen, ½-lb. Bls.	*46¢*	
No. 2½ Mattress, ¼ and ½-lb. Balls	*37¢*	
Wool, 3 to 6 ply	*B 4¾¢; A 5¢*	

Vises—

Solid Box 60¢10@60¢10¢10%

Parallel—

Athol Machine Co.: 40%
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co. 40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50; No. 3, $10.00.
Machinist and Tool Makers' No. 4, $12.50; No. 5, $7.00; No. 6, $10.00; No. 10, $21.50.
Jewelers' No. 7 $4.00
Fisher & Norris Double Screw 15&10%
Hollands':
Machinists' 40@40&5%
Jewelers' 33⅓%
Lewis Tool Co. 20@30%
Merrill's 20%
Millers Falls 60&10%
Massey Vise Co.:
Clincher 40%
Perfect 20%
Lightning Grip 20%
Parker's:
Victor 20@25%
Regulars 20@25%
Vulcan's 40@45%
Combination Pipe 55@60%
Prentiss 20@25%
Sargent's 40%
Smith & Hemenway Co.:
Machinists' 40%
Jewelers' 33⅓%
Snediker's X. L. 33⅓%
Stephens' 33⅓%
Williamson Mfg. Co. Double Swivel 40%

Saw Filers—

Disston's D 3 Clamp and Guide, ℔ doz. $30 25%
Perfection Saw Clamps, ℔ doz. $5.00
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3 45&5%

Wood Workers—

Massey Vise Co.:
Lightning Grip 15%
Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise 60&10%
Holland's Combination Pipe 60@60&5%
Massey's Quick Action Pipe 40%
Parker's Combination Pipe:
87 Series 60%
187 Series 60&5%
No. 870 40%
Williamson Mfg. Co. Double Swivel Combination Pipe 40%

Wads—*Price per M.*

B. E., 11 up 60¢
B. E., 9 and 10 70¢
B. E., 8 80¢
B. E., 7 80¢
P. E., 11 up $1.00
P. E., 9 and 10 1.25
P. E., 8 1.50
P. E., 7 1.50 — *Dis. 15%*
Ely's B. E., 11 and larger $1.70@1.75
Ely's P. E., 12 to 20 $3.00@3.25

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled 50@55&10%
Ground 55@60&10%
Plain or Unground 60@65&10%
Country Hollow Ware, per 100 lbs. $2.75@3.00
White Enameled Ware:
Maslin Kettles 70%
Covered Wares
Tinned and Turned 40%
Enameled 50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware 50&20%
Agate Nickel Steel Ware, Specials 60&15%
Iron Clad Ware 70&10%
Lava, Enameled 40&10%
Never Break Enameled 50%

Tea Kettles—

Galvanized Tea Kettles:

Inch	*6*	*7*	*8*	*9*
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles 65@65&5%
Avery Kettles 60%
Porcelained 50&5@50&10%
Never Break Spiders and Griddles 65&5%
Never Break Kettles 60%
Solid Steel Spiders and Griddles 65&5%
Solid Steel Kettles 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone 40@40&10%

Washboards—

Solid Zinc: ℔ doz.
Crescent, family size, bent frame. $3.25
Red Star, family size, stationary protector $3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $2.90
Cable Cross, family size, stationary protector $3.15
Single Zinc Surface:
Naiad, family size, open back, perforated $2.65
Saginaw Globe, protector, family size, ventilated back $2.50
Brass Surface:
Brass King, Single Surface, open back $3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.25
Glass Surface:
Glass King, Single Surface, open back $3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back $3.25

Washers—Leather, Axle—

Solid 80¢10@80¢10¢10%
Patent 90@90¢5%
Coil: ⅞ 1 1⅛ 1¼ *Inch.*
10¢ 11¢ 12¢ 13¢ per box

Iron or Steel—

Size bolt ⅝ ¾ ⅞ 1 1⅛ 1¼ *Inch.*
Washers $5.20 4.30 3.00 2.80 2.60
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots per lb. 1¼@2¢

Wedges—

Oil Finish lb. 2.15@2.30¢

Weights—Hitching—

Covert Mfg. Co. 40&2%
Covert's Saddlery Works 60&10%

Sash—

Per ton, f.o.b. factory:
Eastern District $25.00
Southern Territory $19.00@20.00
Western and Central Districts $20.00@21.00

Wheels, Well—

8-in., $1.50@1.55; 10-in., $1.45@1.70; 12-in., $2.25@2.35; 14-in., $3.40@3.50.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 80&5@80&7½%
10 to 18 80@80&5%
19 to 26 80&10@80&10&5%
27 to 36 80&5@80&10%
Galvanized:
6 to 9 77½@77½&5%
10 to 14 72½@72½&5%
15 to 16 75&7½@75&10&2½%
19 to 26 75&5@75&10%
27 to 36 72½&5@72&7½%
Coppered:
6 to 9 77½@77½&5%
10 to 14 77½@77½&7½%
15 to 18 75&10@75&10&2½%
19 to 26 75&10&5@80%
27 to 36 75@75&5%
Tinned:
6 to 14 77½@77½&7½%
15 to 18 75&5@75&10%
Annealed, Steel and Tinned, on Spools 70&10&10@70&10&10&10%
Brass and Copper on Spools 60&10@60&10&10%
Brass, list Feb. 26, '96 30&5%
Copper, list Feb. 26, '96 15%
Cast Steel Wire 50%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

List June 24, 1903 90&10&10&10@..%

Wire Cloth and Netting—

Galvanized Wire Netting 80&15@80&17½%
Painted Screen Cloth, 100 ft., $1.20
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft. 3¢
Nos. 4 and 5 Mesh, sq. ft. 3¼¢
No. 6 Mesh, sq. ft. 3½¢
No. 8 Mesh, sq. ft. 4¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural 75&10@75&10&10%
Alligator or Crocodile 70&10@75%
Baxter Pattern S Wrenches 70&5@70&10%
Drop Forged S 45@45&5%
Acme 60&10%
Alligator Pattern 70%
Bull Dog 70%
Bemis & Call's:
Adjustable S 40%
Adjustable S Pipe 40%
Bemis Pipe 60%
Briggs Pattern 40%
Combination Black 40&5%
Combination Bright 40%
Merrick Pattern 50%
Boardman's 33⅓%
Coes' Genuine Knife Hdl. 40&10&5&5%
Coes' Genuine Steel Hdl. 40&10&5&5%
Coes' Genuine Key Model. 40&10&5&5%
Coes' "Mechanics'" 40&10&10&5&5%
Donohue's Engineer 40&10%
Eagle 50&10%
Elgin Wrenches, ℔ doz. $6.25
Elgin Rethreading Attachment, ℔ doz. $6.25
Elgin Extra Dies and Jaws 50%
Gem Pocket 30%
Hercules 70%
W. & B. Machinist:
Case lots 50&5%
Less than case lots 50%
Improved Pipe (W. & B.) 60%
Solid Handles, P., S. & W. 50@50&5%
Stillson 65%
Vulcan Chain 50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ℔ gross, $7.50; ℔ doz. $0.80

Wrought Goods—

Staples, Hooks, &c., list March 17, '92 90@90&10%

Yokes, Neck—

Covert Saddlery Works, Trimmed 70%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters' list net

Zinc—

Sheet per 100 lbs., $7.25@7.50

For the Table of "Current Metal Prices" see the First Issue of Every Month.